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THE APPLICATION OF BIOCHEMISTRY TO MEDICINE*

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IT is often said that medicine is both a science and an art. If this is to be more than a glib phrase, if it is to have any real meaning for us, we must be sure what we mean by the words "art" and "science": what do they have in common, and in what do they differ?

Science is a system of ideas and propositions, which has two aspects, the centripetal and the centrifugal; a myriad observations are concentrated into a few generalizations, and from these generalizations we proceed outwards again to a myriad applications. How tall is a man? How many petals has a rose? What is the "life" of an atom of uranium? The scientist makes a thousand measurements, perhaps all different, and condenses them into a brief statement, probably in the form of an average. Such results are then combined into general rules, to which there may be many individual exceptions: as, that men are taller than women, or that uranium is more stable than radium. From such simple statements we ascend a hierarchy of generalizations and laws that become more and more comprehensive in their scope, until we reach the very limits of the "resolving power" of our language in such words as "life" and "time" and "matter".

Yet all this majestic process would be devoid of practical values, if there were not a parallel process of devolution, if we did not apply this ordered and classified knowledge to the specific problems of the day or of the year. Without its applications, science would be comparable to the Venetian Republic in its last years: maintaining an elaborate espionage system and docketing masses of information, but too weak to take any action or exert any influence on the course of history.

In Art too, though less obviously, we may detect parallel centripetal and centrifugal aspects. The procedures are different, but the end is the same, since, as Blake said, "Art and science cannot exist save in minutely organized particulars". What distinguishes Van Gogh's "Bridge at Arles" from an engineer's blueprint, or Vermeer's "View of Delft" from Baedeker's map of the same city? Surely it is that the works of art possess universality; they lose no whit in interest from our never having been to Arles or Delft. These masterpieces impart knowledge to us, knowledge not only of bridges or cities but of the properties of water and sunlight and the whole world, and the knowledge thus assimilated has its "applied" aspect in that it colours all our subsequent approaches, through our senses, to the world; all the more surely and subtly because it is not in verbal form that we possess that kind of knowledge. So, too, the generalizations which we draw and upon which we inevitably act, from reading "War and Peace" or "The Waste Land" are not verbally present to us, though words are the raw material of this form of art. Most intangible and most pervasive of all is music, towards whose condition "all art constantly aspires"—the words are those of Walter Pater.

Art and science then are alike in that both are means whereby an enormous heterogeneity of the world may be condensed into general summations of experience, compact enough to be comprehensible and to be used as a basis of action and prediction. But whereas science proceeds by the humdrum process of compilation and statistics, the artist, by his genius, extracts the essence of his truth from a single exemplar. It is in this sense that medicine is both a science and an art; the diagnostician, for example, is using the methods of science

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when he notes that in his patient the serum calcium and phosphatase are above and the plasma phosphate below normal, and associates these abnormalities with the hyperparathyroidism in which they have so often been observed; but he is using the methods of art when by a stroke of insight he identifies in his patient some elusive resemblance, not to be set down in words, to some unusual case in his previous experience. It seems futile to ask which of these processes is the "better"; yet we may recall that the lightning-flash of insight is no man's constant possession, and to some it never comes at all.

It may be felt that this has been too long and too pretentious a preface to an address which, after all, deals with the applications in medicine of but a single science: biochemistry. Perhaps; and yet it might be suggested in reply, and in no partisan spirit, that biochemistry is or will be, beyond all other branches of knowledge, *the* scientific basis of medicine. At present, it is true, there is but a limited number of diseases that are generally conceived of and discussed in almost wholly chemical terms: the endocrine disorders, the vagaries of metabolism, the avitaminoses, some of the blood dyscrasias, and the like. There are many other ailments that are currently discussed in the language of physiology, or bacteriology, or immunology; but will it always be so? Given a few years of peace and stability, may we not hope to interpret auricular fibrillation (for example) in terms of derangement of the chemistry of muscle and nerve? Shall we not eventually be able to write an equation for the chemical reaction between exotoxin and tissue constituents that manifests itself as an exanthem? Must there not be some peculiarity, however elusive, in the chemistry of damaged cells that would explain the stresses evident in the brain in Jacksonian epilepsy? To consider such possibilities is not to depreciate the present and future significance of physiology or bacteriology or pathology; it is merely to suggest that as we painfully ascend the hierarchy of generalizations, we shall find that as they become more comprehensive in scope they will tend to become increasingly chemical in terminology.

It is true that the goals indicated are still remote. Our picture of the *normal* chemical activities within the cell is only a half-completed jigsaw-puzzle, and we have only the most fragmentary ideas of the *derangements* of these activities that result from the intervention of a new chemical agent—from the production of a toxin or the exhibition of a drug. Yet progress is being made. There are more than twenty different chemical reactions known to be involved, in sequence, in the conversion of glucose to carbon dioxide and water; and only now, twenty-five years after the discovery of insulin, are we able to point to one of these twenty reactions and say that this one, at least (the reaction of glucose with adenosine-triphosphate to form glucose-6-phosphate, controlled by the enzyme hexokinase), is certainly affected by the available supply of insulin; even here, we do not yet know precisely in what manner it is affected.

In some other cases the focus is sharper, and perhaps three general types may be recoginzed. In the first we divert the cellular enzymes from their true function by supplying them with "imitation" substances with which they combine, but with which they cannot react in the normal manner; the classical case is the inhibition of the oxidase of succinic acid by intervention of the homologous but inert malonic acid, but the "imitation" of para-amino-benzoic acid by sulphanilamide (according to Fildes) is of greater medical interest, and has led to the production of a whole series of synthetic substances (pyrithiamine, pantoyl-taurine, gluco-ascorbic acid, etc.) which can be smuggled into the tissues disguised as the vitamins they closely resemble, but which, once admitted, become saboteurs by refusing to play the parts assigned to them.

In the second type we alter the chemical nature of the enzymes themselves, for example by adding cyanide to cytochrome-oxidase, or di-isopropyl-fluorophosphate to choline-esterase, or less directly by stimulating a muscle to convert phosphorylase-a reversibly into the less active phosphorylase-β and thus perhaps preserving a useful residue of its store of glycogen.

In the third and final type we add a substance which enters into competition with the tissue enzymes, as British Anti-Lewisite (dithiolpropanol) tears arsenic out of their grasp and convoys it safely out of the body.

These instances have seemed to merit discussion, because it is probably along such lines that we shall find explanations of the action of drugs and toxins. From a knowledge of the enzyme systems affected, it may be possible to proceed

to an interpretation not only of physiological but even of morphological changes, such as metaplasia. *Terra incognita,* indeed, yet even here there are a few scattered observations to point the way: the calcification of rachitic cartilage *in vitro,* when immersed in normal serum; the keratinization of vaginal mucous cells in vitamin-A deficiency or under the influence of œstrogens; the action of the carcinogenic hydrocarbons; the production of a typical tubercular tissue-reaction by the injection of a purified fatty acid (phthioic acid, recently doubtfully identified as 3, 13, 19-trimethyl-tricosanoic acid) extracted from tubercle bacilli. The tissue-culture technique is at the moment somewhat out of favour; it may not yet have been applied to the problems it is best fitted to resolve.

It would not be unfair criticism to suggest that, thus far, this survey has resembled the hero of Longfellow's "Excelsior": bearing a banner rich with very "strange devices", it has disregarded the present world of human affairs and pressed on starry-eyed towards the high inhospitable glaciers of a future medical philosophy. It may even have given the false impression that the present applications of biochemistry to medicine are undeserving of discussion, and this should be dispelled.

Note, however, that it is a vulgar error to judge a science largely by its products: to acclaim Edison and Luther Burbank as scientists, and to think of science as an absent-minded Santa Claus, dropping down the chimneys of the (sometimes embarrassed) world a profusion of gifts, from nylon to television, from penicillin to the atomic bomb. To think thus is to ignore all the centripetal aspect of science, and all but a few terminal twigs of its centrifugal aspect. Medicine is, of course, too conscious of its background to fall into such errors: yet it must be acknowledged that many a clinician, save when the bustle of activity allows a rare pause for reflection, thinks of biochemistry chiefly as a collection of analytical procedures whose results he has found useful in diagnosis. The biochemist is, naturally, glad to be of use; it is not true of him, nor of any other scientist, that he is indifferent to human welfare, nor that he would

> "view with equal eye
> Atoms or systems into ruin hurled,
> And now a bubble burst, and now a world."

Nevertheless the professional biochemist may view the bustling activity of the hospital laboratory with something akin to dismay; not merely because it is a very incomplete representation of his science, but also and especially because it makes pragmatic use of determinations whose interpretation may strike him as more than a little uncertain. He notes, for instance, that high values for plasma cholesterol concentration are regarded as typical of myxœdema on the one hand and of diabetes on the other; but he is not clear what rôle cholesterol may play in either case, nor why the phenomenon should appear in two disorders which otherwise seem to have little in common and may at times be incompatible: for we have seen cases of hypothyroidism in which diabetes appeared whenever the metabolic rate was raised to normal and vanished again when the rate was allowed to drop back.

In many other cases the approved analytical procedures are unintelligible: the serum "albumin-globulin ratio" is based on a quite arbitrary fractionation, some individual proteins appearing in both categories; the "non-protein nitrogen of blood" subsumes substances of which some are waste-products and some not, and which certainly do not all vary together; the "CO_2-combining power" determination does not even profess to measure anything existing in the patient, it is a study of the response of the patient's blood to artificial and improbable circumstances; the "blood creatinine" analyses include varying amounts of unidentified materials; the "direct and indirect van den Bergh reactions" defy convincing interpretation. As long as such methods give results that the physician can use, their artificiality may not be of great moment, but the biochemist feels about them much as any scientist feels when his wife insists on replacing a burnt-out fuse with a copper cent: that the procedure is inelegant and potentially dangerous. The wife, of course, experiences a similar sensation when the scientist insists on setting forth in the morning with one button too few.

Since the methods of blood analysis have been singled out for disparagement, it is only fair to pay some tribute to their values. Consider for a moment the dependence of a diagnosis of hyper-insulinism or of renal glycosuria on blood-sugar determinations; of gout on uric acid, of hyperparathyroidism on serum calcium; of nephrosis on serum protein—to instance only a few. In a broader sense, too, these

practices have been salutary; the behaviour of the sulphonamides has taught us to think of dosage merely as a method of attaining and maintaining the desired concentration of the drug within our tissues. This logical attitude is now even reaching the nutritionists, whose dictatorial insistence on the eternal "rightness" of some specified figure for the daily intake of vitamin X or Y is being ever so slowly tempered by the realizations that men are not mass-produced to a standard pattern, and that a vitamin exerts its influence in the brain or liver or muscle and not in the œsophagus; in this case, unfortunately, the blood is not truly representative of the tissues as a whole. Perhaps there is a general lesson here; it is above all the ease of sampling that directs our attention to the blood, and it is only for a very few substances that we know the relationship between the concentration in the blood and the concentration in the tissues. Our ignorance is brought home by Hastings' plausible argument that the pH of muscle varies inversely with that of plasma.

These questions will become practical and acute when the cyclotron and the uranium pile supply weapons against disease, especially cancer, instead of weapons against our fellowmen. The hypothesis is that we can find radioactive materials which will be avidly taken up by the cells we wish to destroy, so as to produce intense ionizing radiations within them, while the concentration of the substance and the intensity of the radiation in other parts of the body remains harmlessly low. It has already been shown that radio-iodine behaves in this way towards a thyroid carcinoma and its metastases, and exerts within the cancerous thyroid cells a destructive power unattainable by external roentgenotherapy and yet safe. Other elements might have the same specific affinity for other cell-types, as iodine has for the thyroid; but good instances do not suggest themselves. There is need for research here; and if the chemical elements prove disappointing, it is conceivable that we might find organic compounds with specific affinities so high as to retain them within cells of some designated type, long enough at least for the short-lived radioactivity of C^{11} to decay to harmless levels.

A review of the applications of biochemistry to medicine would be worse than incomplete if it made no mention of the many valuable therapeutic agents whose existence was first demonstrated in laboratory experiments and whose preparation in usable form was first achieved by biochemical techniques: the hormones from insulin to corticosterone, the vitamins from calciferol to folic (pteroyl-glutamic) acid, and many others. Even if we now use these things mainly in the form of synthetic products from the manufacturer, the biochemical isolation was a prerequisite for the synthesis; and even if we soon find ourselves using the mightier agents of an atomic age, the biochemical investigation of their localization and metabolism will be essential. Many times, too, biochemical studies have suggested therapeutic uses for materials originally prepared for quite other purposes: the nitrogen-mustards, aluminium acetate, and thiouracil are topical if insufficiently-tested examples.

To elaborate this theme would be to destroy the emphasis for which this review has striven, upon biochemistry as a science: not a mere purveyor of devices and products, but a body of knowledge increasingly integrated and imbued with a philosophy of its own. It is tempting, if invidious, to name briefly some of its most fundamental problems. There is the problem of the manner in which the foodstuffs are oxidized in the unfavourable circumstances of low temperature, great dilution, and neutral reaction; now partly solved by the recognition of many of the essential catalysts, several of which have gained in interest unpredictably from their relation to the vitamins. There is the problem of the transfer of energy, as from oxidation to growth or from glycolysis to muscular contraction; now interpreted mainly in terms of the organic phosphates. There is the problem of the rates of breakdown and resynthesis of living matter, with its relevance to wasting disease and convalescence; now vastly illuminated by the use of isotopic "tracers", especially by Schoenheimer and his pupils. There is the still baffling problem of the fine-structure of proteins, crucial for immunology and for the questions in enzymology previously discussed, and crucial also for discussion of the mode of action of genes. Twenty-five years ago, these problems loomed distantly before us, a majestic and inaccessible Himalaya; today we are struggling in the foothills, and here and there, if the peaks remain unscaled, we have gained the passes and look out towards new horizons. Biochemistry is passing through a revolution almost as great as that of biology in the years of the cell-theory, or of physics in the days of quanta and relativity; it is coming of age.

SOME PHYSIOLOGICAL PRINCIPLES IN SURGERY OF THE STOMACH*

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FOR this occasion, I have chosen to speak on certain aspects of the physiology of the stomach that appear to be of significance in the surgical treatment of peptic ulcer. During the past four years, my associates and I have sectioned the vagus nerves to the stomach as a method of treatment for severe and intractable ulcers. The operation has been performed on 140 patients, and the results thus far have been so favourable that this method has replaced all other types of surgery for this disease on our service. During the course of this work, certain observations have been made on the secretory and motor functions of the human stomach that cast additional light on the pathogenesis of peptic ulcer, and it is this problem that I should like to deal with this afternoon.

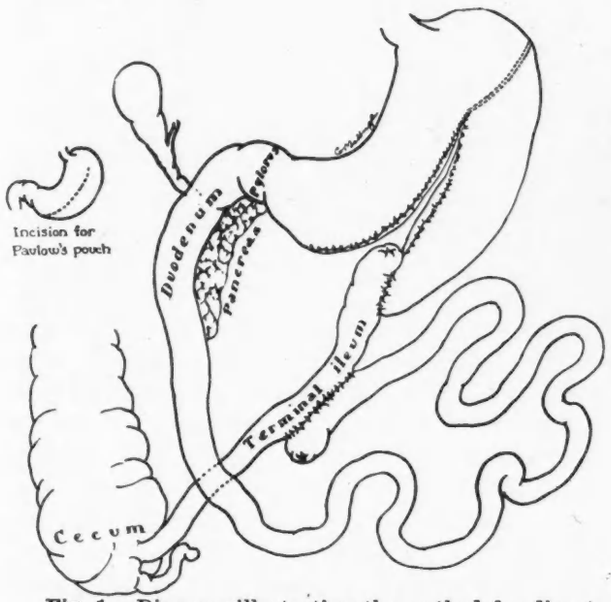

Fig. 1.—Diagram illustrating the method for diverting pure gastric juice from a Pavlov pouch into the intestines.

The central fact that has been brought into view by the work of the experimental laboratories on the cause of ulcer may be stated as follows. Pure gastric juice, as it is secreted by the mucosa of the fundic part of the stomach, has the capacity to digest all living tissue including the walls of the jejunum, duodenum, and of the stomach itself. Previous damage to the mucosa does not seem to be required, but when this is present, the involved area succumbs more rapidly. Demonstration of these facts has been made in various ways, and I choose for illustration two experiments I made several years ago.[1] The pure undiluted fundus secretion is readily obtained in dogs by making an accessory small stomach pouch after the method of Pavlov. If this pouch is united with the intestines (Fig. 1) instead of being converted into an external fistula, the gastric juice excited by the ingestion of food passes directly into the intestine. No dilution or neutralization of the gastric secretion takes place since the food is in the larger compartment of the stomach. The intestinal mucosa exposed to this pure secretion is rapidly digested away. The resulting defect has the same punched-out appearance characteristic of peptic ulcers elsewhere (Fig. 2), and

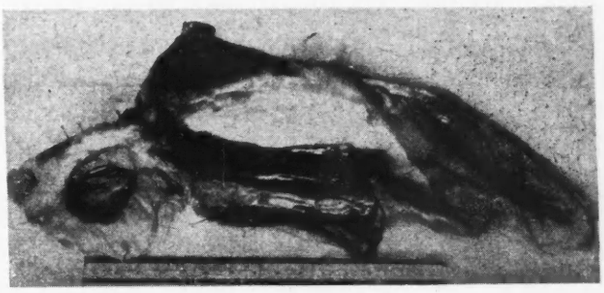

Fig. 2.—Photograph showing a large penetrating ulcer in the ileum opposite the entrance of gastric juice from a pouch as in Fig. 1.

tends to progress, with hæmorrhage or perforation the final result. The experiment is a counterpart of those ulcers occurring in the intestines of man in the region of a Meckel's diverticulum containing heterotopic gastric mucosa.

While the Pavlov accessory stomach pouch has proved to be of the greatest value in studying the physiology of gastric secretion, it has certain definite disadvantages. It is difficult to preserve the entire vagus supply to the isolated stomach, and the small size of this compartment is a further handicap. In order to avoid these objections, about 17 years ago,[2] we began a series of studies on gastric physiology, utilizing a completely isolated stomach preparation such as was described by Fremont.[3] The stomach is tran-

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sected at the cardia and pylorus and the ends closed. The œsophagus is anastomosed either to the upper end of the duodenum or to the side of the jejunum (Fig. 3). Great care is taken not to interfere with the vagus nerves or with the blood supply to the isolated stomach. The gastric secretion may be collected quantitatively

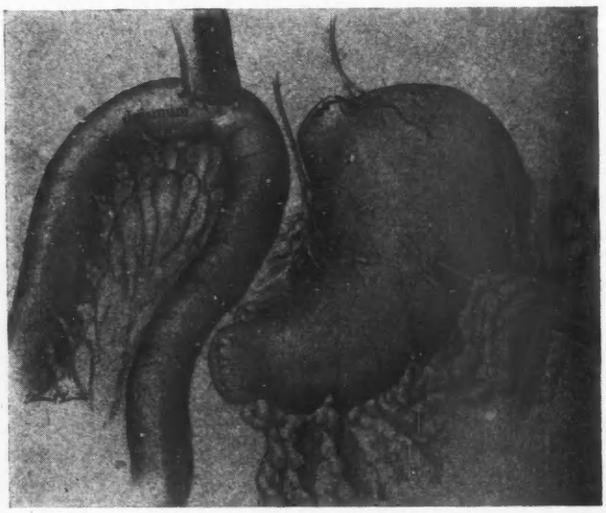

Fig. 3.—Diagram illustrating the totally isolated stomach with intact blood supply and vagal innervation.

by means of a gold-plated cannula fixed in the fundus with several pursestring sutures. While the surgical technique involved presents some difficulties, my associates and I have studied over fifty successful preparations of this type in our laboratory. Of the many observations made, I should like to comment on three that appear to have special significance to surgeons.

Although in such a preparation the ingested food passes directly from the œsophagus into the intestines, the isolated stomach secretes large amounts of highly acid gastric juice. One to two litres are regularly obtained each 24 hours from dogs weighing 10 to 12 kilos. This secretion produces a progressive hypochloræmia, alkalosis, and dehydration in spite of free access to unlimited food and water. The animal literally secretes itself to death in the short space of 10 to 12 days. Death is due to the loss of sodium and chloride ions in the gastric juice, since if these are provided by the daily intravenous injection of physiological salt solution, the animal remains in good health for long periods, and no alterations in the chemistry of the blood occur. It is a startling fact that the mechanism which provides for the secretion of gastric juice takes precedence over those factors which operate to maintain a constant composition of the blood upon which life itself depends. The experiment indicates clearly the effects that may be expected in man whenever the gastric juice fails to reach the lower absorbing intestines where its electrolytes can be returned to the blood.

A second observation of interest in this experiment is the frequent appearance of typical peptic ulcers in the isolated stomach (Fig. 4). Twenty-seven such lesions have been found to date, and I believe it is quite probable that they would appear in every case if the animal could be kept alive for a year or more. This is significant when contrasted with the almost complete absence of spontaneous ulcers in the dog. Of added interest is the fact that these ulcers

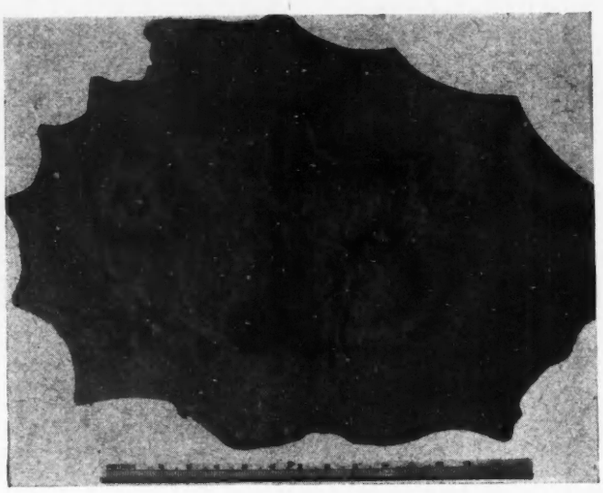

Fig. 4.—Photograph showing a spontaneous gastric ulcer in the isolated stomach as in Fig. 3.

never appear in a stomach isolated in the same way but to which the vagus nerves have been divided. The appearance of these ulcers appears to be correlated with the volume and acidity of the gastric juice. They may develop within a week in a profusely secreting stomach, or not for several months when the volume of secretion is low. It seems likely that the absence of ulcers in the isolated stomach after vagus section is also due to the greatly diminished gastric secretion characteristic of these animals.

A third point of interest brought out by the experiments on the isolated stomach concerns the amount and quality of the gastric secretion and of the effects of vagus section thereon. When we reflect on the extensive studies that have been made on the gastric secretion of man and lower animals, it seems strange that we have no reliable data on the total volume of gastric juice produced in 24 hours, nor on the propor-

tion of that volume that is dependent on nervous and on humoral stimulation. Apparently, there is no way to subject the stomach of man to the normal stimulus of food and collect the total secretory output. The isolated stomach of the dog is favourable for such studies since the gastric juice can be recovered quantitatively for many months. The nervous component of gastric secretion remains intact, as does that portion of the humoral element dependent upon the release of gastrin from the upper intestinal mucosa. The failure of food to enter the stomach possibly decreases the amount of gastrin produced, and, of course, the mechanical effect caused by gastric distension is absent.

In a study that is presently being conducted in my laboratory with the aid of Drs. E. Bruce Tovee and Edward R. Woodward, the following data have been secured. One animal secreted an average of 1,100 c.c. of gastric juice per 24 hours for a two-week period, with a free acidity of 116 clinical units. This fell to an average of 410 c.c. with a free acidity of 30 clinical units after division of the vagus nerves above the diaphragm. A second animal secreted an average of 500 to 800 c.c. with a free acidity of 33 to 90 clinical units before vagotomy, and this was reduced to 40 to 100 c.c. with a free acidity of 0 to 12 clinical units after the vagus section.

It is clear that in such a preparation, neurogenic factors play a much greater rôle than humoral or other influences in determining the total volume of gastric juice produced in 24 hours and especially of the output of hydrochloric acid. In the first case, the acid secreted was reduced by the vagotomy to one-tenth of the original amount, and in the second, to about one-sixtieth of that originally produced.

If it be conceded that pure gastric juice can digest all living tissues, the question arises, why is not the stomach and duodenum normally digested away. The answer seems to be that these tissues are not exposed to pure gastric juice for any long period of time. Food, which is the normal stimulus for gastric secretion, is also the chief factor which protects the mucosa from its corrosive action. Other factors which play a similar but less important rôle are the neutralizing and buffering action of the gastric mucus and the alkaline duodenal secretions. Exalto[4] and Mann and Williamson[5] demonstrated that failure of the duodenal secretions to reach the upper intestinal tract would regularly lead to the development of typical peptic ulcers in experimental animals. The clinical significance of this discovery was lessened somewhat when it became evident that abnormalities in pancreatic and biliary secretion do not occur in ulcer patients nor is there failure of these secretions to empty into the duodenum in normal fashion.

The experiment of Wangensteen and his associates[6] probably bears more directly on the clinical problem. These investigators produced and maintained an excessive continuous secretion of gastric juice in the empty stomachs of experimental animals by implanting pellets of histamine and beeswax into the subcutaneous tissues. The gradual absorption of histamine provoked a constant stimulation of the gastric glands and typical peptic ulcers promptly appeared in the duodenum and pyloric antrum.

These findings take on added significance in view of the recent demonstration that an excessive continuous secretion of gastric juice occurs in most patients with peptic ulcer. The work of the older gastro-enterologists demonstrated that patients with ulcers, on the whole, secrete a little more gastric juice in response to the stimulus of food, alcohol, or histamine than do normal individuals. The difference is, however, not very great and is not sufficiently uniform to have much diagnostic value. It is in the activity of the empty stomach that the more striking contrast is seen. This is best determined at night when the patient is shielded from the sight and odor of food, and the stomach has been carefully emptied and lavaged. A Levine tube is introduced through the nose into the stomach and constant suction maintained for twelve hours until the following morning. Under these conditions, an average of 250 to 400 c.c. of fluid is obtained from the stomach of normal adults and of patients with gall stones, regional enteritis, and miscellaneous diseases other than peptic ulcer. The free acidity of this aspirate ranges between 0 and 20 clinical units, indicating that the output of the parietal cells is small and that considerable dilution and buffering has occurred.

Patients with duodenal ulcer, on the other hand, have uniformly been found to yield under identical conditions a night secretion of 600 to 2,500 c.c. with a free acidity of 40 to 110 clinical units. If this is calculated in terms of hydrochloric acid content, it is apparent that the ulcer patient secretes from 2 to 10 times as much acid as does the normal individual when there is no

obvious stimulant to the gastric glands. The data from the experimental laboratories suggest that it is this copious secretion of gastric juice in the empty stomach at night and free from the buffering effect of food that is most apt to destroy the mucosa, produce an ulcer or cause exacerbation in one already present.

This excessive continuous secretion is reduced to normal values by vagotomy, thus proving that it is neurogenic in origin. There appears to be, for some reason, a secretory hypertonus in the vagus nerves reminiscent of the vagotonia of earlier writers. It is attractive to speculate that in some way the tensions, anxieties, and frustrations of modern life are responsible for this hypertonus and that it is in this way that the central nervous system plays a rôle in the ulcer problem. It may not be out of place to record here two observations that are of interest in this connection. Continuous gastric secretion studies were being made on one of my patients, a lawyer, who had a duodenal ulcer. During the course of these studies a friend entered the room and engaged my patient in a game of chess. The level of secretion continued unchanged for some time when suddenly a marked augmentation occurred. This coincided with a period of increased tension when it appeared likely that the patient would be check-mated. As a matter of fact, he commented jocularly that he would not like to have such a tube in his stomach if he were playing poker, as the flow of juice would reveal his hand. In another patient a sudden augmentation of gastric secretion occurred when the patient became angry during the course of a psychiatric examination. A repetition of this experience after gastric vagotomy was entirely without effect.

The relief of ulcer distress following vagotomy has been so uniform, prompt, and complete as to suggest that the stomach has become anæsthetic through removal of its sensory nerve supply. This is, however, not the case. A suggestive experiment was performed on three patients with duodenal ulcer who were experiencing severe distress when they entered the hospital. This distress was relieved temporarily by emptying the stomach but recurred in severe form when 200 c.c. of 0.5% hydrochloric acid solution were instilled into the stomach (Palmer's acid test). Following gastric vagotomy, all three patients experienced immediate and complete relief. On the third or fourth day, while the patient's attention was diverted, the Wangensteen apparatus was disconnected and a solution of hydrochloric acid, warmed to body temperature, was injected slowly through the Levine tube into the stomach. Within 1 to 10 minutes, severe epigastric pain, similar in character to the previous distress appeared, and this promptly disappeared on withdrawing the injected acid.

These findings suggest that the relief of pain produced by vagotomy is due chiefly to the marked reduction in the acidity of the gastric content. Doubtless, the reduction in the tonus and motility of the stomach also plays an important rôle, but the effect is certainly not due to anæsthesia.

Complete division of the vagus nerves to the stomach causes prompt healing of gastric, duodenal, and gastro-jejunal ulcers.[7] This is indicated by the persistent absence of ulcer symptoms in spite of cessation of all medication and dietary restrictions, gain in body weight, and objective evidence of healing as determined by fluoroscopic study, *i.e.*, the disappearance of craters and lessening of deformities. In six cases of gastric ulcer, these criteria have been supplemented by direct visualization with the gastroscope. Healing regularly occurred, often with surprising rapidity. The healing of gastro-jejunal or stomach ulcers is particularly impressive since these lesions are usually intractable to medical management. There are twelve of these cases in our series and they have followed gastro-enterostomy, gastro-duodenostomy, and partial gastrectomy. In 122 patients with duodenal ulcer, a gastro-enterostomy in addition to the vagus section has been performed in 62, either because of obstructive symptoms or fluoroscopic findings. Obviously these cases cannot be cited as evidence for the beneficial effect of vagotomy since gastro-enterostomy alone has proved curative in some cases. There have been no recurrent or stomal ulcers in this group.

The important problem in peptic ulcer, however, is not the initial healing of the lesion, but rather the prevention of recurrence. Will vagus section cause these ulcers to stay healed in spite of resumption of an ordinary diet and the customary occupation with its anxieties and tensions? The first cases were operated upon just four years ago, and the majority within the past three years. This is clearly too short a time to permit any final judgment in a disease like peptic ulcer. However, the first patients are still well, and

what is perhaps of greater importance, there has been no regeneration of the secretory fibres in the vagi in any case. This is manifested by the persistent decrease in the volume and acidity of the continuous secretion, and the negative response of the gastric glands to insulin hypoglycæmia and the sham meal. These findings are very encouraging. They indicate that nerve regeneration is not going to be the problem here that it has proved to be in surgery of the sympathetic system. This might have been anticipated in view of the extreme difficulty encountered in getting the recurrent laryngeal nerves to regenerate when they have been accidentally severed in thyroid surgery. It is possible that here again the experimental laboratory will have to be called upon for the final answer.

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EFFECT OF QUININE AND ATABRINE ON GASTRIC SECRETION*
(A preliminary communication)

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ACCORDING to clinical observations the hypersecretion of gastric juice in man plays an important rôle in the genesis of gastric, duodenal, or marginal peptic ulcer. It is claimed that in the absence of HCl-pepsin secretion ulcers of all three types develop very rarely. In many instances, too, the overactivity of the gastric glands is believed to be of psychogenic origin. If in such cases the secretory impulses to the stomach are transmitted via the nervous system, undoubtedly it is through the vagus nerve, being *par excellence* the gastric secretory nerve. This in itself creates exceedingly unfavourable conditions for an ulcer patient, since it is a well established fact that any form of vagal stimulation—direct, reflex, or central (*e.g.*, by insulin hypoglycæmia)—evokes a secretion of gastric juice extremely rich in pepsin and with a very high acidity, *i.e.*, able to digest easily any protein material.

Whatever the gastric hypersecretion may be—a cause or a symptom of peptic ulcer—it is evident that for therapeutic purposes it is most desirable to reduce it in ulcer patients. Apart from different methods of medication—alkali, alumina gel, milk drip, etc., and lately enterogastrone (Ivy 1944, 1945), urogastrone and anthelone (Sandweiss 1943, 1945; Bourque, Friedman, Patterson and Sandweiss 1943)—various surgical procedures have been employed to relieve peptic ulcer patients from distress or to prevent dangerous complications. Although in many cases remarkable improvement and even cure of such patients were achieved, neither the therapeutic measures nor even very radical surgical interference gave consistently satisfactory results. One of the causes responsible for the failure of medical and surgical treatments is the failure to reduce to a desirable level the excessive production of the acid gastric juice. The search for new drugs or new surgical procedures which could greatly diminish the secretory activity of the gastric glands is therefore justifiable.

For a long time our laboratory has been interested in the effect of quinine on the parasympathetic nervous system. Repeating the old experiments of R. Heidenhain (1868) on the effect of quinine on the salivary glands, Stavraky (1933) found that quinine hydrochloride administered intravenously to the dog paralyzed the secretory fibres in the chorda tympani (for the submaxillary gland) and in the auriculo-temporal nerve (for the parotid gland). A detailed investigation of the effect of quinine on the vagus nerve to the heart was recently performed (Babkin and Ritchie 1945). It was found that quinine bisulphate in moderate doses (from 15 to 20 mgm. per kg. body weight of a medium-sized dog) produced a partial paralysis of the heart vagus stimulated by induction current. Larger doses (from 50 to 80 mgm. per kg.) were

* This study was aided by a grant from the Banting Research Foundation.

required to produce its complete paralysis. Eserine restored the functional activity of the paralyzed vagus nerve.

The next problem was to study the effect of quinine as well as of its substitute atabrine (atebrin, akrichin, mepacrine) on the vagal innervation of the gastric glands. The present communication deals with an investigation of the effect of quinine and atabrine in dogs on gastric secretion evoked by two methods: (1) by faradization of the vagus nerves; (2) by subcutaneous administration of histamine dihydrochloride in anæsthetized dogs. The first method is representative of parasympathetic stimulation of the gastric glands, the second one of their chemical stimulation. Besides this the effect of quinine and atabrine on vagal gastric secretion was tested in a dog with œsophagotomy and a gastric fistula.

The following preliminary communication is a report of some experiments on the effect of these two drugs on gastric secretion in the dog.

EXPERIMENTAL RESULTS

Total number of experiments performed with intravenous administration of quinine bisulphate and atabrine was 26. The gastric secretion was evoked by rhythmic, alternate vagal stimulation in 8 of them, and by histamine in 18. Apart from minor variations, analogous and consistent results were obtained in each of the two types of experiments: vagal effect was markedly inhibited by intravenous administration of quinine bisulphate or atabrine, whereas the gastric secretion induced by histamine was affected only with very large doses of these drugs.

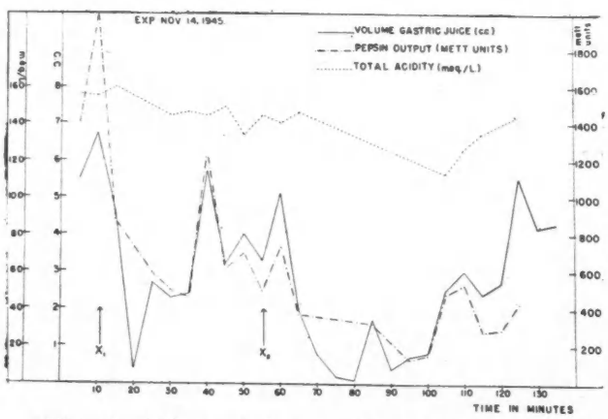

Fig. 1.—Effect of intravenous administration of quinine bisulphate on the volume and composition of gastric secretion produced by rhythmic, alternate vagal stimulation. X_1 0.2 gm. quinine bisulphate injected intravenously. X_2 0.2 gm. quinine bisulphate injected intravenously.

Quinine bisulphate was introduced intravenously in anæsthetized dogs in doses averaging 18 mgm. per kg. body weight. A single dose of 0.2 gm. *e.g.*, to a dog of 11.0 kg. (Fig. 1) produced a sharp but rather transitory diminution in secretion. A second dose of 0.2 gm. quinine bisulphate given to this animal produced a long lasting depression. In about one hour and fifteen minutes, the gastric glands began to respond to the vagal stimulation with a volume of secretion which approximated the initial level.

The acidities (free and total HCl) of the gastric juice after the administration of quinine followed their usual course, *i.e.*, they decreased with the diminution of the rate of secretion and rose again when the secretion increased. The amount of pepsin discharged from the peptic cells (so-called "pepsin output") greatly diminished after the intravenous injection of quinine bisulphate.

Atabrine dihydrochloride was administered intravenously to anæsthetized dogs in doses averaging 10 mgm. per kg. body weight. Such doses were used because it was demonstrated that the effect of atabrine on the heart vagus (Gertler and Karp) and on the coronary blood vessels (Babkin and Melville) was approximately five times greater than that of quinine.

Atabrine, like quinine, greatly diminished the vagal secretion and the discharge of pepsin from the peptic cells (Fig. 2). The acidities of the

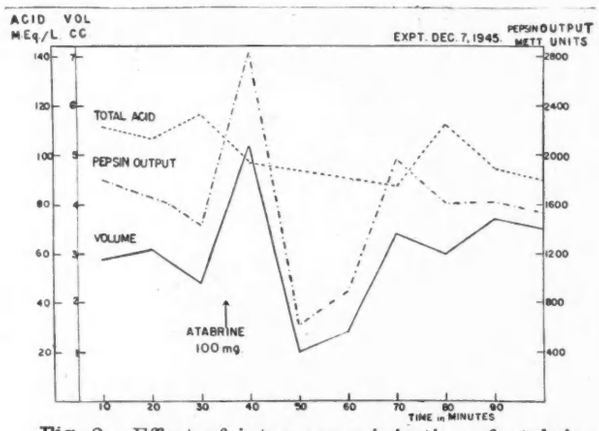

Fig. 2.—Effect of intravenous injection of atabrine on the volume and composition of gastric secretion evoked by rhythmic vagal faradization.

gastric juice paralleled the course of the secretion.

It is important to note that during the first 5 to 10 minutes after administration of quinine or atabrine there was an initial increase of the gastric secretion, followed by inhibition. This can be attributed in all probability to the

transient dilatation of the blood vessels in the stomach. Both drugs produced a fall of blood pressure which was due not to cardiac depression, but rather to their direct action on the blood vessels. Dreisbach and Hanzlik (1945) have shown that the seat of vasodilatation following intravenous injection of quinine is in the peripheral blood vessels. Babkin and Melville (1946) demonstrated that quinine and atabrine dilate the coronary blood vessels of the perfused isolated rabbit heart. Atabrine produced this effect after administration of atropine.

As was already mentioned above, the *gastric secretion evoked by histamine* (Fig. 3) was inhibited only by toxic doses of quinine or atabrine.

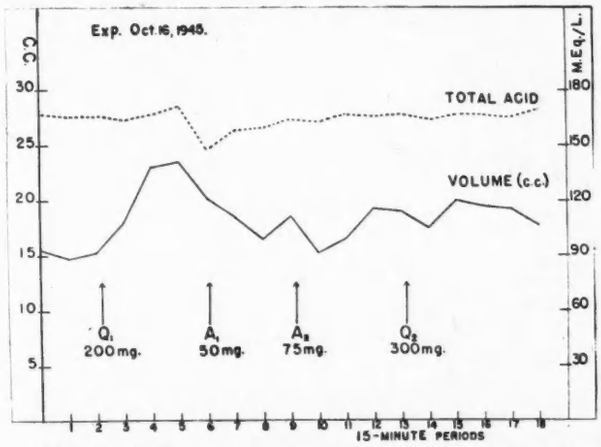

Fig. 3.—Effect of intravenous injection of quinine and atabrine on the volume and acidity of gastric secretion evoked by subcutaneous administration of histamine. Q = Quinine bisulphate. A = Atabrine dihydrochloride. The secretion was not diminished.

Intraduodenal injection of quinine in anæsthetized dogs in varying amounts (from 100 mgm. to 1 gm.) also inhibited the gastric secretion elicited by stimulation of the vagi. However, if the second injection of the drug was administered too soon (less than 3 hours) after the first, it did not produce the desirable inhibitory effect. This was probably due to impaired absorption of quinine.

The result with atabrine, under similar experimental conditions, was not as well defined, although a somewhat delayed inhibitory action on the vagal gastric secretion did occur after intraduodenal injection.

Experiments on a normal dog with œsophagotomy and a gastric fistula. Oral quinine therapy produced a slight or no inhibitory effect on the gastric secretion evoked by 5 minutes sham-feeding. However, in some experiments after discontinuation of the quinine therapy (which lasted one week) the inhibition became apparent. More satisfactory results were obtained with atabrine (0.35 gm. of atabrine daily in three divided oral doses for one week to a dog with an average weight of 23 kg.). There was a marked inhibition of gastric secretion evoked by 5 minutes sham-feeding (Fig. 4).

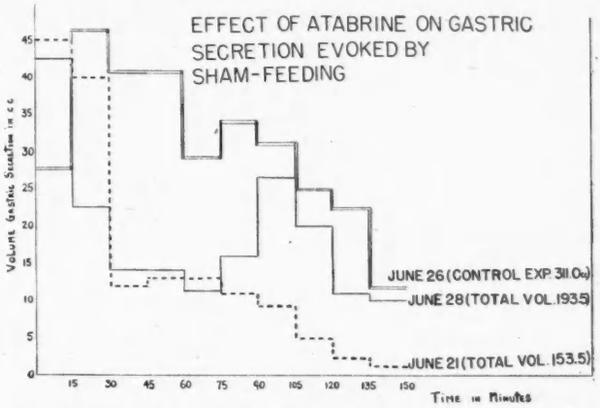
EFFECT OF ATABRINE ON GASTRIC SECRETION EVOKED BY SHAM-FEEDING
JUNE 26 (CONTROL EXP. 311.0c)
JUNE 28 (TOTAL VOL. 193.5)
JUNE 21 (TOTAL VOL. 153.5)
Time in Minutes

Fig. 4.—The effect of atabrine on gastric secretion in response to five-minute sham-feedings in a dog with an œsophagotomy and a gastric fistula. June 21, during atabrine therapy. June 26, control after therapy discontinued. June 28, 0.1 gm. atabrine 25 min. before sham-feeding.

DISCUSSION

The inhibitory effect of quinine and atabrine on gastric secretion evoked by vagal stimulation and absence of this effect when the secretion was induced by histamine administration can be explained in terms of the different mechanisms which participate in the stimulation of the gastric glands in each case.

There is good reason to believe that the vagus nerve acts on the secretory cells of the gastric glands through the intermediation of a chemical transmitter—acetylcholine. In all probability quinine or atabrine interferes in some yet unknown way with the action of acetylcholine in the excitatory process. It was demonstrated for the heart vagus (Babkin and Ritchie, 1945) that its paralysis by quinine could be fully restored by eserine, which is known to prevent the destruction of acetylcholine by the choline esterase, and thus increases the concentration of the chemical transmitter at the nerve endings. Other explanations of the restorative action of eserine can be given, *e.g.*, that quinine diminishes the permeability of the cellular membranes for acetylcholine whereas eserine increases it; or, that quinine interferes with the origination of an action current by acetylcholine at the vagal nerve endings, and eserine abolishes this un-

favourable effect of quinine; and so on. The effect of quinine in depressing transmission at the motor end-plates of striated muscles is now considered analogous to the effect of curare (Harvey, 1939, Carey, 1944). But whichever explanation will be adopted it seems very probable that in moderate doses quinine or atabrine does not empoison the cells of the effector organ and that its inhibitory action on the impulses arriving along the vagus nerve is presumably due to some difficulties in the transmission of these impulses to the muscular tissue of the heart. Such explanation can probably be applied also to the inhibitory effect of quinine and atabrine on the function of the secretory fibres of the gastric vagus.

Quite different relations were observed when the gastric secretion was stimulated by histamine. Neither quinine nor atabrine, employed in moderate doses, affected it. Only when an animal was subjected to the action of large or repeated doses of these drugs did the secretory function of the gastric glands become impaired. The inability of quinine and atabrine in moderate doses to inhibit histamine gastric secretion finds its explanation in a peculiar property of histamine to act directly on the secretory cells of the gastric glands (chiefly on the parietal cells). Even such a powerful parasympathetic paralyzing drug as atropine practically does not interfere with histamine gastric secretion, whereas in very small doses (1 to 3 mgm. per animal) it completely abolishes the effect of vagal stimulation of the gastric glands. Quinine and atabrine possess a weak atropine-like action since they do not interfere with the secretory action of histamine when given in moderate amounts. Large doses of these drugs, especially quinine, must be looked upon as toxic. In such circumstances not only do they diminish the function of the gastric glands, but they lower the blood pressure markedly and affect the heart itself.

Whereas the effect of moderate doses of quinine on vagal secretion in a normal dog with œsophagotomy and gastric fistula was weak and uncertain, atabrine gave more definite results. The effect of quinine under these circumstances was presumably complicated by its multiple actions in the body (diminution of the blood sugar, rapid destruction by the liver, absorption in the tissues etc.), and must form the subject of a special experimental investigation.

In spite of the preliminary character of this investigation, it seemed desirable to us to report our results to the medical profession. As was pointed out in the introduction of this paper the chief efforts of medical men and surgeons at the present time are directed towards the diminution of gastric secretion in ulcer patients. The chief cause of the hypersecretion in such patients is presumably the overactivity of the vagal secretory fibres to the gastric glands. Very radical procedures, with the aim to decrease the excessive production of the gastric juice were proposed and carried out by surgeons: subtotal gastrectomy, subtotal gastrectomy with anterior vagotomy, or double vagotomy subdiaphragmatic or supradiaphragmatic (Dragstedt, Palmer, Schafer, and Hoges, 1944).

Though some investigators reported satisfactory results obtained in peptic ulcer patients following these operations, these procedures do not lack criticism. Berkman and Heck (1945) described some unfavourable symptoms, exclusive of recurrent ulceration, which may follow partial gastric resection. Among the transitory, though very unpleasant symptoms, they mention post-prandial jejunal distension, known as the "dumping" syndrome, which may result in inanition. In some cases they observed hypochromic microcytic anæmia which failed to respond to the usual treatment for this ailment. More serious is the criticism of partial and double vagotomy by Weinstein, Colp, Hollander and Jemerin (1944). They state that vagotomy, especially supradiaphragmatic, which alone may guarantee that all vagal fibres to the stomach are cut, is a difficult and risky operation. Besides this, it deprives all the abdominal viscera of vagal innervation. Partial vagotomy can never diminish the volume and rate of gastric secretion substantially because, as has been well established by experimental physiology, the intact vagus nerve replaces the function of the sectioned one. Nevertheless, even after both total and partial vagotomy, there still remains the chemical and the interdigestive phases of gastric secretion which may be very injurious to an ulcer patient.

The clinicians and surgeons must solve all these controversial problems. The task of a physiologist is to search for less radical and more rational methods of controlling gastric secretion, which do not necessitate irreparable damage to the stomach or its innervation, particularly the innervation of all the abdominal viscera. The most promising and truly physiological method of diminishing gastric secretion in animals and

man is based on the use of enterogastrone. The preparation of enterogastrone extracts and its successful use in Mann-Williamson dogs and ulcer patients has been studied extensively by Ivy and his co-workers (Ivy 1944, 1945).

Before the enterogastrone therapy of peptic ulcer is elaborated and the preparation itself becomes available in quantity, it seems to us that it would be desirable to treat ulcer patients with some other substances which are able to decrease the secretion of the gastric juice. Owing to the complicated nature of the action of quinine in the body and the necessity of a further investigation of its effect at the present time, it does not seem that it will be a suitable drug for clinical tests. Quite different is the case with atabrine. The actions of therapeutic, *i.e.*, moderate doses of this drug, are well known. Atabrine will act on gastric secretion mildly and will diminish to a certain extent that phase of gastric secretion, *i.e.*, the nervous or cephalic, which is so much exaggerated in ulcer patients.

The actual doses of atabrine which can be used in ulcer patients will have to be found out. In dogs, weighing 3 to 4 times less than man, human doses of atabrine produced a desirable effect. Recalculated on the basis of human weight such doses may prove to be excessive.

Special cases of peptic ulcers will have to be selected clinically in which a moderate inhibition of vagal gastric secretion would be beneficial. Very little use can be expected, even harm may be done, by employing atabrine in cases with a tendency to hæmorrhage, owing to the vasodilatory action of this drug. Since the effect of atabrine on gastric secretory function is transient, a prolonged treatment seems to be necessary.*

SUMMARY

1. Intravenous administration of moderate doses of quinine bisulphate (0.2 to 0.3 gm. to dogs of 10 to 15 kg.) or atabrine (0.05 to 0.1 gm. to dogs of 8 to 12 kg.) markedly diminished the gastric secretion produced by rhythmic vagal stimulation.

2. Small or moderate doses of quinine or atabrine did not affect gastric secretion evoked by the subcutaneous administration of histamine.

3. The amount of pepsin discharged from the peptic cells (pepsin output) under the influence of vagal stimulation was diminished after intravenous administration of quinine or atabrine.

4. Quinine bisulphate (200 mgm. to 1 gm.) introduced intraduodenally (dogs 7 to 14 kg.) during stimulation of the vagi diminished the secretory rate of the gastric glands following a transitory increase, which could be explained by the dilatation of the gastric blood vessels. On the other hand, intraduodenal administration of atabrine (21 to 31 mgm. per kg.) produced only a slight transitory and delayed inhibitory effect.

5. During oral therapy the effect of quinine on gastric secretion in a normal dog with an œsophagotomy and a gastric fistula was rather weak. The most striking response both in regard to the liquid and enzyme (pepsin) portions of the juice occurred as an "after-effect" following conclusion of therapy. In the case of atabrine therapy, more definite evidence of an inhibitory action was obtained.

6. General indications, suggested by the physiological and pharmacological effects of atabrine on gastric secretion, are presented for the use of this drug in the mild therapeutic treatment of peptic ulcer. However, the need for appropriate clinical investigation is stressed.

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* It would be very desirable and interesting to obtain comparative data on the frequency of formation and especially on the course of peptic ulcers in the armed forces, *e.g.*, those who fought in France and Germany on one hand and those who were in Italy, where atabrine was used largely for antimalarial purposes. The same refers in general to the European and Pacific theatres of World War II.

A public health axiom is that each new communicable disease victim represents a public health failure. This definition must be broadened for the venereal diseases to read "each new case of syphilis or gonorrhœa represents a failure both of public health and of society itself."—R. A. Vonderlehr and J. R. Heller.

A GEOGRAPHICAL STUDY OF HAY FEVER PLANTS IN MANITOBA*

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THE accurate diagnosis and treatment of pollinosis in any area demands a knowledge of the flora producing air-borne pollen in that area. While atmospheric studies of pollen are very helpful, they are limited in their usefulness for many obvious reasons. Such atmospheric studies have been reported in Manitoba.[1, 2] During the past several years, we have made notes of the location and density of the various important hay fever plants in this Province, but throughout the summer of 1945, one of us (D) made an extensive and systematic tour of the inhabited parts of the Province to clarify our knowledge. Previously, information had been obtained from many sources, such as the Provincial Department of Agriculture and its field representatives, the University of Manitoba, Department of Botany, schools, etc. Much of this information was useful, but sporadic, and much required confirmation and revision. This report is intended as an authoritative record of the situation as it is known at present.

Manitoba is located in the centre of Canada and bounded on the south by the 49th parallel of N. latitude, which separates it from the states of Minnesota and North Dakota. To the north, it extends to the 60th parallel and in the west it is bounded by Saskatchewan, a prairie province. Although Manitoba has an area of 251,833 square miles, only 105,130 or less than 42% is accessible. Of this accessible area, which is south of parallel 54:50, 19% is covered by water, 36% is forested, 12.4% is cultivated and 10.2% is grass land. Muskeg occupies 18% and the balance is made up of rock and bush and, of course, by townsites and roads. Thus, for the purpose of this study, less than 25% of the accesible portion of the Province, or one-tenth of the whole province is of primary importance as a source of hay fever plants.

The accompanying map indicates the vegetation zones of Manitoba. The great northern portion consists of tundra, a transitional region and a coniferous zone. The area east of Lake Winnipeg is part of the rocky forested region known as the Pre-Cambrian shield. The arable and most densely inhabited portion is found in the southern and western part of the province and consists chiefly of grassland and aspen grove. The lowlands occupy a wide diagonal strip, extending in a northwesterly direction, between the large lakes. This area is transitional between the coniferous belt and the mixed woods. Much is swamp and muskeg, but there is also some farmland. This cursory description of the Province will indicate its botanical form. The forested eastern and northern portions have little grass and none of the troublesome weeds have reached it except in such resort areas as Kenora which used to be a hay fever refuge, but which is now becoming infested with the ragweeds and sages as roads are built and farms developed in the small fertile valleys.

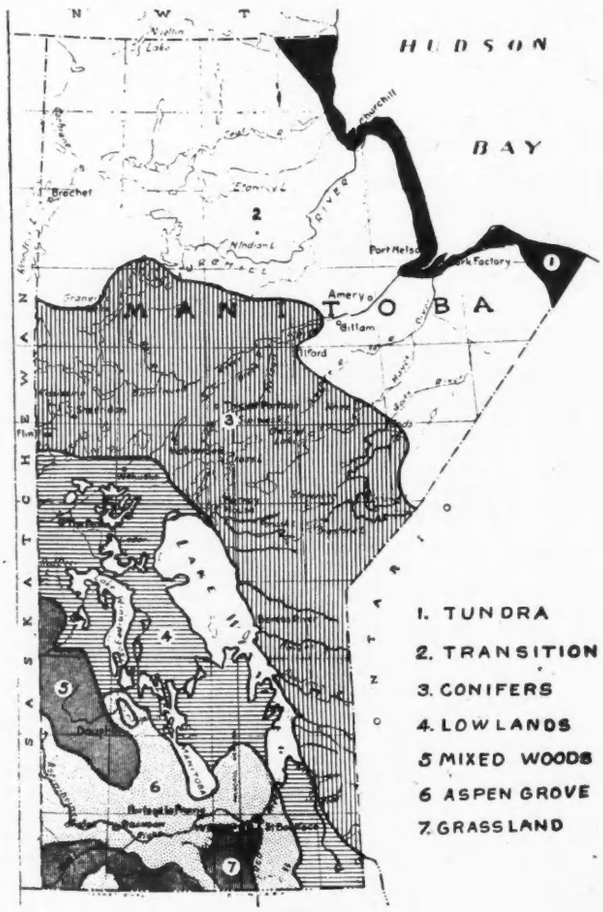

Fig. 1

Plants responsible for producing clinical pollinosis are those whose pollen is wind-borne or anemophilous, therefore we have confined our survey to these. There are three broad classes of these anemophilous plants; trees (including shrubs), grasses and weeds. The latter includes some true grasses, such as couch grass and wild oats. These three broad classes have distinct pollination periods. In the spring the trees and shrubs have a short and intensive one. In the early summer the grasses pollinate heavily for a few weeks, although some continue to bloom all summer. The weeds pollinate in late summer and early autumn.

TREES AND SHRUBS

Native trees in Manitoba comprise both coniferous and deciduous species. The former occur extensively in the eastern and northern

*Presented at the meeting of the Canadian Society of Allergists, June, 1946.

From the Department of Allergy Division of Medicine, the Winnipeg Clinic.

parts of the Province. They pollinate heavily in May and in late June when the lakes are covered with a thick yellow film of spruce or pine pollen respectively. It is generally thought that these pollens are not toxic, but further study may show that they play some part in hay fever. Indians in these areas are said to have seasonal rhinitis at this time, but we have not been able to establish proof. The most abundant conifers are black and white spruce, balsam fir and jack pine. There is also some tamarack, Eastern white cedar, white pine and Norway pine.

The most important deciduous trees causing pollinosis are the poplars, the Manitoba maple (*Acer interius* or *A. negundo*), the white elm (*Ulmus americana*), the green ash (*Fraximus pennsylvanica*), the black ash (*F. nigra*), the basswood (*Tilia americana*), the paper birch (*Betula papyrifera*), the bur oak (*Quercus macrocarpa*), and the peach-leaved willow (*Salix amygdaloides*). The poplars, maple, elm and ash are planted extensively in the cities, towns and villages. Of the many shrubs, the most important are the willows (*Salix spp.*), the alders (*Alnus spp.*), the hazels (*Corylus spp.*) and the dwarf birches (*Betula spp.*).

Native poplars include the aspens (*Populus tremuloides*) which is the most abundant tree in the southern part of Manitoba, the balsam poplar (*P. balsamifera*), the cottonwood (*P. deltoides*), and the large-leaved poplar (*P. grandidentata*). Pollination is early, usually in the latter half of April, the average date being April 20. The pollen is abundant and toxic.

The elm is found naturally along the water courses, in the aspen grove belt and is very extensively planted in cities and towns. It pollinates heavily for a few days, usually in the last week in April, but the dates vary between the extremes of April 18, (1946) to May 11, (1945). Many patients are very sensitive to elm pollen.

The Manitoba maple pollinates about the same time as the elm or soon after, but has a slightly longer pollination period. It is native along the water courses and is widely planted in urban and rural centres. It sheds an abundance of toxic pollen. The ash commonly pollinates early in May, but may not do so until the fourth week of May, as in 1945. It is found with the elm and maple in moist habitats, but is less abundant and is probably of minor clinical importance. The paper birch pollinates about the same time as the ash. It occurs in all wooded areas, except the aspen grove belt. It is not extensively cultivated, but produces much light pollen of doubtful antigenicity. Oak is the last tree to bloom, usually after mid-May and it has a more prolonged pollination period, often extending

DISTRIBUTION OF TREES

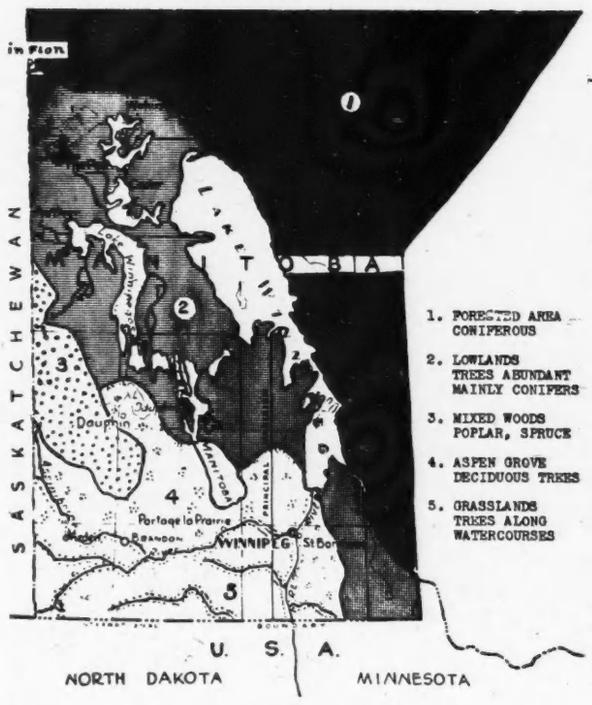

Fig. 2

POLLINATION DATES OF TREES

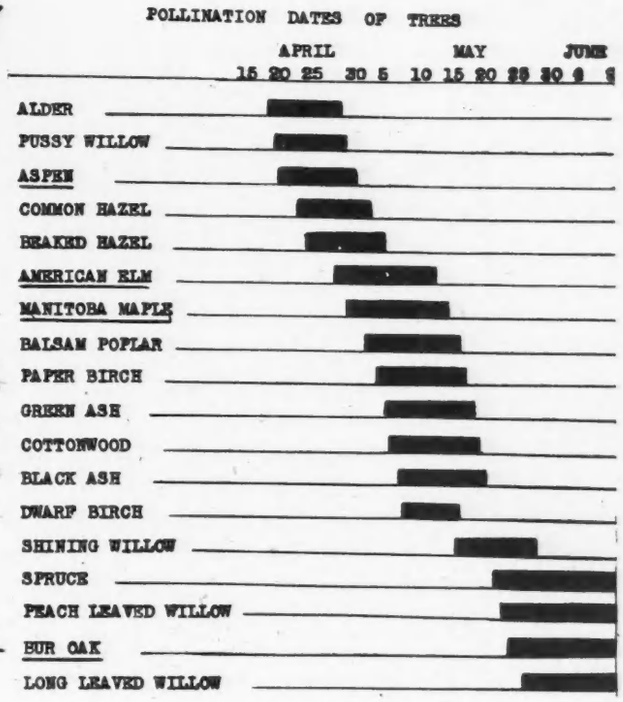

Fig. 3

into June. It occurs sporadically throughout the Province, especially along the Manitoba escarpment, a range of hills extending north-westerly across the south-west corner of the Province and including the Pembina, Riding, Duck and Porcupine mountains. In the Manitoba lowlands, the oak reaches its greatest size. Its pollen is of considerable clinical importance.

Willows (*Salix spp.*) are widespread and are especially associated with the aspen. The first to produce pollen is the pussy willow (*S. discolor*) in the third week in April, but the other species produce pollen at varying periods up to early June. Though the pollen is abundant, little of it is air-borne.

Hazel is abundant in the aspen grove belt and blooms at approximately the same time as the aspen and pussy willow, but, being a very low shrub, its pollen is never found in large amounts in the air. The alder is common in moist habitats, especially in the north-west part of the Province, including the Flin Flon. It is a tall shrub, often reaching tree-like proportions. It pollinates abundantly about April 20, and is probably clinically important. The dwarf birches pollinate abundantly about two weeks after the alder and about the same time as the paper birch. They occur in moist habitats, mainly in the aspen grove and in the north and east.

The dates of pollination referred to above, apply to the southern and most populous parts of the Province. In the more northerly regions, blooming will not occur until sometime later.

GRASSES

A very large number of species of grass are found in Manitoba, but most of them are relatively unimportant to our study. It was manifestly impossible to record any but the more important species. Grass pollens are large and light and have very thin coverings. Unless the weather is hot and dry, they tend to absorb water rapidly, increasing their weight so that they do not remain air-borne long. The flowers are comparatively close to the ground and are often sheltered from the wind, thus their chances of wide distribution are further decreased.

The most widely distributed and clinically important grasses in Manitoba are: blue grass (*Poa spp.*), timothy (*Phleum pratense*), and redtop (*Agrostis alba*). All these are cultivated grasses which have escaped and spread all over south-western Manitoba. Their pollen is abundant and toxic.

The blue grasses (June grasses) are among the first to bloom, commencing in late May or early June and continuing into the middle of July. The three most important are Kentucky blue grass (*P. pratensis*), growing wild in all settled portions of the Province; Canada blue grass (*P. compressa*) which blooms a few days later than *P. pratensis* and which is more localized in its distribution; and the annual blue grass (*P. annua*). Clinically, the pollen of all these species behaves identically.

Timothy (*Phleum pratense*) starts to pollinate abundantly about the last week of June and continues in lessening amounts until frost. It is the most widely distributed of the Manitoba grasses and produces a highly toxic pollen. It is probably the most important of all grasses clinically.

Redtop (*Agrostis alba*) commences pollination in late June and continues through July. It is less widely distributed than the foregoing since it requires a moist habitat. It is most abundant in the valleys of the Red and Assiniboine rivers. Pollen is abundant and toxic. Brome grass (*Bromus inermis*) is widely cultivated and often planted on road allowances. It blooms heavily in the first week in June, slowly diminishing through July. It produces relatively little pollen and its clinical importance is doubtful. Reed canary grass (*Phalaris arundinacea*) is found in aquatic habitats and is being introduced in increasing amounts as hay in the swamp lands. Its pollen is large (40 to 45 microns) and is probably a very minor factor in hay fever.

The cereal grasses cultivated in Manitoba are wheat, oats, barley, rye and corn, of which the first three are self-pollinated. Rye pollen is abundant but large (54 microns) and does not travel far. Corn pollen is still larger (95 microns), but because the plant is tall, tends to travel further and to be found on pollen slides. None of the cereal pollens are of importance clinically.

Another common grass found in the grasslands west of the Red River is Western June grass (*Koeleria cristata*), often called crested hair grass. It is in full bloom from the middle of June to the middle of July and pollinates heavily. It is probably of some clinical importance.

Couch, twitch or quack grass (*Agropyron spp.*) is a weed of widespread occurrence

throughout the cultivated parts of the Province, but it produces only small quantities of pollen and is therefore of secondary importance.

The sedges (*Carex spp.*) and bulrushes (*Scirpus spp.*) are common in the moist areas of the southern parts of the Province. The hay of the swamps is a sedge, in contrast to the grass of cultivated hay. Pollination starts in the spring and continues into early summer. The grains are found on pollen slides in dry weather, but are not known to cause hay fever.

The late, or fall grasses are less important in hay fever, since they produce less pollen and are not abundant. These grasses are sheltered from the wind by other vegetation which is taller and more dense in the autumn. They occur chiefly in moist habitats and are therefore local in distribution. They are thought to be important causes of hay fever on the Pacific coast, but for the above reasons, are probably of minor importance here.

The most abundant species of fall grasses, in order of pollination are:

Wild oats (*Avena fatua*)	June-July
Wild barley (*Hordeum jubatum*)	June-July
Green foxtail (*Setaria viridis*)	July-August
Wild rice (*Zizania aquatica*) (Whiteshell Forest reserve only)	July-August
Buffalo grass (*Grama spp.*)	15th July-August
Barnyard grass (*Echinochloa spp.*)	August
Marsh grass (*Spartina spp.*)	August
Slough grass (*Beckmannia erucæformis*)	August
Reed grass (*Phragmites communis*)	August
Spear grass (*Stipa viridula*)	August
Blue stem (*Andropogon spp.*)	August

The cattail (*Typha latifolia*) often erroneously called a bulrush, is very common in swamps and small lakes and pollinates abundantly in July and August. The pollen grains, though small, adhere to each other in tetrads, forming a larger mass, but since the plants are tall, they may spread widely under suitable weather conditions. Cattail pollen has been known to cause hay fever (Vaughan), but is probably only of local importance.

WEEDS

The families of weeds known to cause hay fever in Manitoba may be divided into two groups, as follows:

1. Those of primary importance. (*a*) *Compositæ*, the chief representatives of which are the ragweeds and sages. This family includes also the sunflower, dandelion, sowthistle, and goldenrod. The latter are clinically unimportant because of their sparse production of heavy sticky pollen which can only reach the patient by rather intimate exposure, though in dry windy weather, their pollen may become air-borne. The latter are found on pollen slides occasionally. (*b*) *Chenopodiaceæ*, of which the Russian thistle is of the greatest importance. This family also includes the burning bush (Kochia) which is very widespread and an important source of pollinosis, lamb's quarters, goose foot, sugar beet (when grown for seed).

DISTRIBUTION OF GRASSES

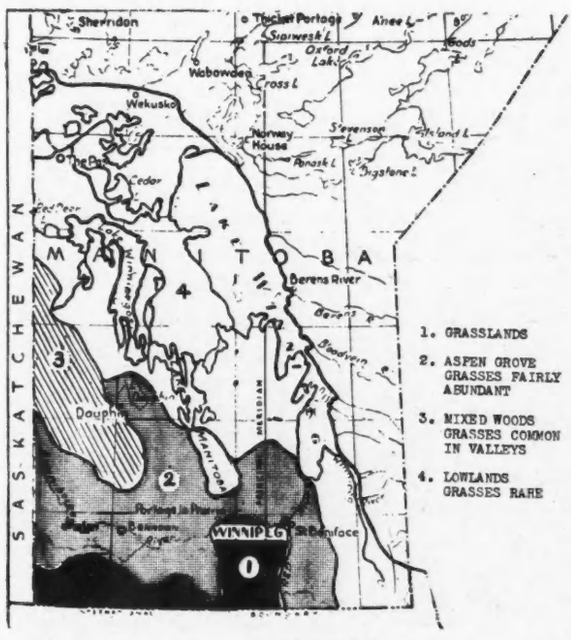

Fig. 4

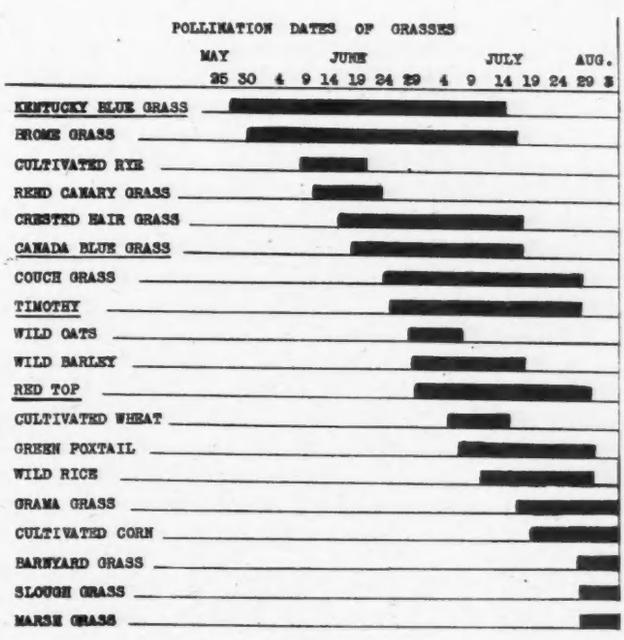

Fig. 5

2. Those of secondary importance. (*a*) *Amaranthaceæ*—pigweeds; (*b*) *Polygonaceæ*—buckwheat, docks, sorrel; (*c*) *Plantaginaceæ*—common plantain; (*d*) *Leguminosæ*—clover and alfalfa.

COMPOSITÆ (AMBROSIACEÆ AND CARDUACEÆ)

Ambrosiaceæ.—The ragweed tribe includes the most important members of this family. Their pollen is plentiful and toxic and its plants also are important as sources of seasonal dermatitis. The giant ragweed (*Ambrosia trifida*) occurs across most of southern Manitoba and has been found as far north as Swan River. It was also found in the resort area of Kenora, Ontario, but here the plants were not "giant", being but 18 inches tall. The giant ragweed blooms throughout August. Perennial or western ragweed (*A. psilostachya* or *A. coronopifolia*) was found to be as abundant as the giant variety, being especially plentiful in the dry grassy areas. As it does not grow very tall, it is apt to be overlooked among the surrounding flora. In contrast, large clumps of giant ragweed are seen readily on road sides and in waste land. The western ragweed was found to be plentiful in grain fields also. It blooms towards the end of July and continues through August until the weather becomes too cool to permit the opening of the anthers.

The short or common ragweed (*A. artimisifolia*) has been reported as occurring in Manitoba, but we were unable to find any in the Province. Each time it was reported to be present, the roots were examined and the plant was found to be the perennial variety. While it may be only of academic importance, we feel it should be emphasized that this species was *not found.*

The false ragweed, or burweed marsh elder (*Iva xanthifolia*), belongs to the genus *Cyclachæna.* It is the most abundant ragweed in the Province and is especially noticeable in the grasslands. It is taller and more leafy than the giant ragweed and comes into bloom in August and continues until the weather is cold. It produces large quantities of pollen which can be distinguished from *Ambrosia,* microscopically, but not clinically. The poverty weed (*Iva axillaris*) is found rarely and produces little pollen. The cocklebur (*Xanthium communis*) is common throughout the Province but does not pollinate heavily and is probably of minor importance in consequence. Its antigenicity is similar to that of ragweed.

CARDUACEÆ

While this is called the thistle family, its most important members from a clinical point of view are the sages (*Artemisia spp.*) of which there are several species in Manitoba. Although they produce very toxic pollen, they bloom late in August and September and thus do not produce much pollen unless the season is late.

The most abundant of the artemisias is pasture, or prairie sage (*A. frigida*). It forms a silvery mat over gravelly hills and in other dry habitats, especially those which have been overgrazed. It is common in the grasslands in southwest Manitoba and as far north as Russell. *A. ludoviciana* (prairie or wormwood sage) is also widely distributed in dry places.

Biennial wormwood (*A. biennis*) is abundant in moist habitats, such as depressions in fields, roadsides and waste places. Its leaves are green, rather than silvery.

Other sages occurring widely in Manitoba are dragon sage (*A. dracunculoides*) in the western half of the Province, wormwood, (*A. absinthium*) is fairly common in all settled areas and *A. caudata* grows well to the north.

The pollen of all the sages is closely related antigenically.

CHENOPODIACEÆ

This family contains three of the principle causative agents of fall hay fever in Manitoba. These are Russian thistle (*Salsola pestifer*), burning bush (*Kochia scoparia*) and lamb's quarters (*Chenopodium album*). Russian thistle blooms from late in July through August. It is abundant in the drier parts of the grasslands, but is seen as far north as Dauphin, in dry seasons. Its incidence varies greatly, being very troublesome in drought years and much less abundant in normally moist seasons. It produces an abundance of very toxic pollen and is a major cause of hay fever in dry years. Burning bush (also called summer cypress) occurs as a weed in all urban areas where it has escaped from cultivation. It is especially abundant in Winnipeg. It blooms in August and sheds an enormous amount of very toxic pollen. Antigenically, it is very closely related to Russian thistle.

Lamb's quarters occurs as a garden weed in all settled areas and when it is very abundant,

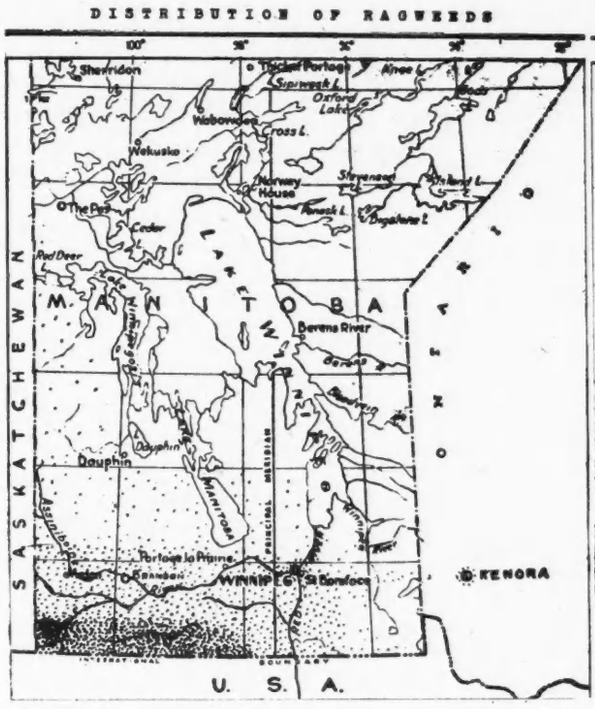

Fig. 6

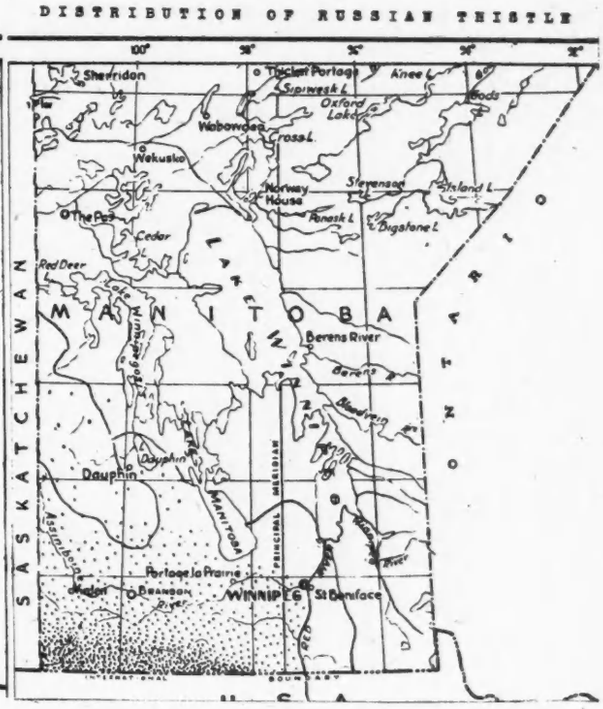

Fig. 7

Fig. 6.—The dotted area indicates the extent of ragweed distribution as it was found. The character of the strippling represents the ragweed population density.

causes hay fever locally. In 1945, it was unusually vigorous and plants eight feet tall were noted. It blooms in late July and early August. Related species of equally wide distribution are the oak-leaved goosefoot (*C. glaucum*) and the maple-leaved goosefoot (*C. hybridum*). They are much shorter plants and their pollen does not travel far.

The Russian pigweed (*Axyris amaranthoides*) also blooms in July and August and is widely distributed on cultivated land and in waste places of all towns and villages. Its clinical importance is not known. The shadscoles or saltworts (*Atriplex spp.*) are found in dry and saline habitats throughout the Province as far north as Flin Flon, but are not abundant. As they produce little pollen they are probably of little clinical importance.

AMARANTHACEÆ

The principal weed of this family occurring in Manitoba is the redroot pigweed (*A. retroflexus*) which blooms in July and August. It is very commonly seen on cultivated land and in waste spaces. It is not generally abundant, though it may be so in patches in settled areas. Pollination is not profuse, so that it is apt to be important only where the plants are numerous. Related species found are the amaranth tumbleweed (*A. græcizans*) and the prostrate amaranth (*A. blitoides*). They are found in all towns but are not abundant and are easily overlooked.

POLYGONACEÆ

The only wind-pollinated genus of this family found widely distributed was Rumex, chiefly *R. crispus* (curled dock) and *R. mexicanus* (narrow-leaved dock). These plants pollinate in July and August. Pollination is not heavy and the pollen is of doubtful clinical importance.

PLANTAGINACEÆ

The English plantain which is such an important hay fever plant elsewhere, is not found in Manitoba. The common plantain (*Plantago major*) is abundant in all settled areas of the Province. It is a very short plant and does not pollinate heavily, so that its pollen has a short range and hence it probably has local importance only. In further contrast with the tall English plantain which pollinates intensively for a short period, the low common plantain pollinates slowly and steadily over a long period.

LEGUMINOSÆ (CLOVERS AND ALFALFA)

The members of this family are insect-pollinated normally, but the explosive discharge of

pollen which occurs when the flower is disturbed by an insect or by a passing animal may cause it to be air-borne for short distances and, therefore, farmers or others in close contact with it may become sensitive. The common sweet clover (*Melilotus alba*) is grown as feed, but it has escaped and become a weed in southern Manitoba. The yellow sweet clover (*M. sativa*) is also abundant and alfalfa (*Medicago sativa*) is grown commonly as hay throughout the Province. The wild clovers (*Trifolium spp.*) being small plants and found in sheltered situations are unimportant, though widespread. All the clovers pollinate from June to late August.

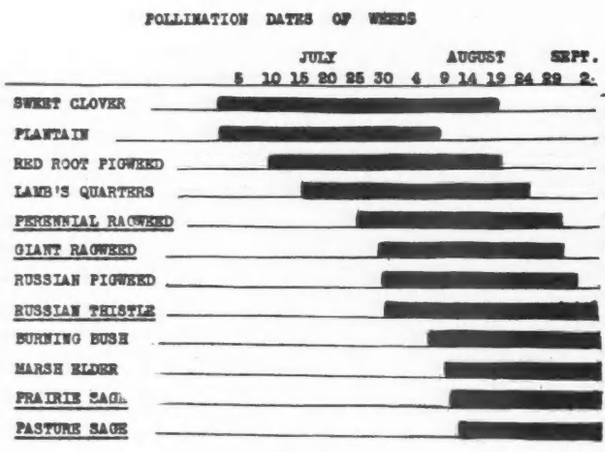

Fig. 8

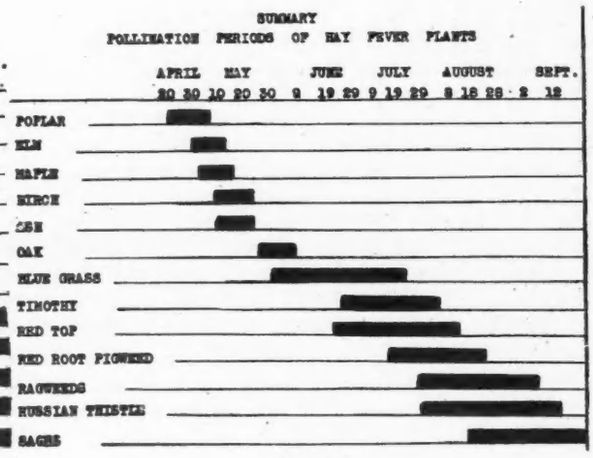

Fig. 9

SUMMARY

1. A brief outline of the vegetation zones of Manitoba has been made. Only two-fifths of the Province is accessible and, of this accessible portion, about one-quarter is of importance in hay fever.

2. Spring pollinosis is due to trees and shrubs. Of the trees, the most important are the poplars, elm, Manitoba maple and oak. Of the shrubs, the most outstanding are the willows, birches and alders. Their distribution and pollination characteristics are recorded.

3. Summer pollinosis is caused by the grasses of which timothy, June grass and redtop are the most important. Their distribution and pollination habits have been described.

4. Pollinosis in the autumn is due almost entirely to weeds. The weeds of greatest importance are the giant and perennial ragweeds, the burweed, marsh elder, the Russian thistle, the burning bush and the sages. An account of their distribution and pollination has been given.

5. The time and amount of pollination varies greatly from year to year.

6. As the area of settlement spreads northward, the flora tends to be modified and hay fever plants increase. Recurrent drought cycles in cultivated regions have encouraged a rather extensive spread of weeds especially those important in pollinosis.

We desire to acknowledge our indebtedness to the departments of Argriculture, Education and Mines and Natural Resources of the Province of Manitoba, and to the Dominion Rust Laboratory for much helpful assistance. We are also indebted to Dr. R. D. Bird, Dominion Entomologist, Brandon, and Mr. Alfred Strachan of Carman, who helped greatly in this study.

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The Winnipeg Clinic,
St. Mary's and Vaughan Sts.

D.D.T. sprayed from airplanes has been used to kill flies in the control of poliomyelitis. How much good this does is questionable, because no one is certain of the part flies play in the spread of the disease, and, furthermore, neither a lasting nor an economical control of flies is affected in this manner. Such a procedure for the control of flies, filth-inhabiting insects, might be considered analogous to the substitution of airplane sprays of soapy water for personal cleanliness.—T. M. Rivers, *J. Am. M. Ass.*, **132**: 428, 1946.

DIAGNOSIS AND TREATMENT OF PARA-ŒSOPHAGEAL HIATUS HERNIA*

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THE reasons for presenting a paper on para-œsophageal hiatus hernia are as follows; the incidence of this type of hernia is greater than is generally understood; it is capable of producing symptoms and disability more than is recognized; it is readily diagnosed; the results of treatment are very satisfactory.

Herniation through the diaphragm may occur at one of several sites. Apart from those resulting from trauma the usual possibilities depend upon the imperfect development of the diaphragm. Common situations for a defect are found in the dome of the diaphragm, the para-sternal openings of Morgagni, the pleuro-peritoneal canals of Bodlchuk and the œsophageal hiatus (Fig. 1). Herniation through the para-œsophageal hiatus is the most frequently encountered. It is produced by the upward passage of the fundus of the stomach into the posterior mediastinum through a hiatus which is abnormally large due to developmental failure. As the stomach passes through the hiatus, the peritoneum, which is reflected from the under surface of the diaphragm to fuse with the serosa of the stomach, accompanies it to form a fold or sac which is paragastric as much as para-œsophageal (Fig. 2). Other abdominal viscera such as portions of the intestine or the spleen, which occasionally traverse the hiatus, are found within this sac, while the stomach actually forms part of the sac, resembling in this way the sliding hernia of the sigmoid.

The possibility of such a hernia occurring depends upon several factors, namely, the size of the œsophageal hiatus, age of the patient and conditions producing increased intra-abdominal pressure such as obesity, constipation, pregnancy, and trauma to the abdominal wall. The hiatus, apart from that portion occupied by the œsophagus, normally admits the tips of one or two fingers and this examination is one which should be routinely followed in the exploration of the upper abdomen. Hiatuses which permit the introduction of three or more fingers are abnormally large and may be considered the site of a future hernia if such a condition is not already present.

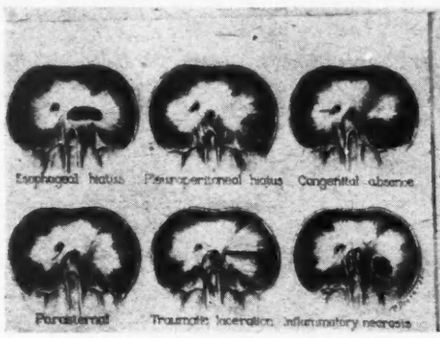

Fig. 1

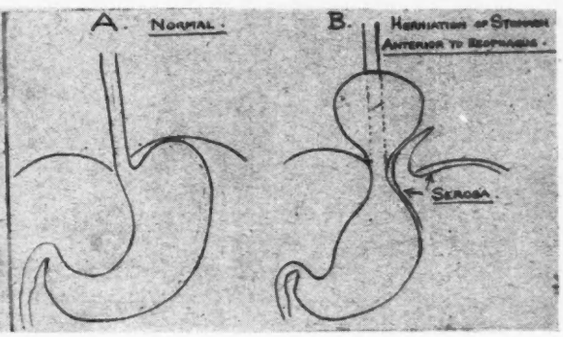

Fig. 2

Fig. 1.—Situations of congenital structural defects and traumatic lacerations of the diaphragm of diaphragmatic hernia (after Harrington). **Fig. 2.**—(*a*) Normal position of stomach. (*b*) Enlarged œsophageal hiatus showing portion of stomach in posterior mediastinum anterior to œsophagus.

The size of the hernia also is important as far as the severity of symptoms is concerned. Often a widely dilated hiatus which will permit a freely mobile and distensible herniating portion of the stomach is least commonly associated with symptoms. Conversely, a smaller hiatus capable of incarcerating a portion of the stomach and permitting no distensibility is more likely to produce symptoms.

Closure of the hiatus depends upon the presence of a membrane of connective tissue rich in elastic fibres which becomes atrophic with advancing life. If obesity develops, as it tends to do in the post-menopausal or later sedentary years, this membrane is further

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weakened by infiltration with fat. Repeated pregnancies and other conditions causing increased and prolonged intra-abdominal pressure will attenuate this tissue and, if an unusually large hiatus is present, cause or set the stage for herniation at a later time.

Several of our cases gave a history of onset of symptoms which suggests that the hernia may develop as a result of trauma to the abdomen at the very time of the injury but it is thought that the larger proportion of cases occurs progressively over a relatively long period. Like other herniæ, also, the hiatus hernia for the most part, is reducible and the stomach is found in the thorax only in the presence of certain conditions which will be considered.

SYMPTOMS AND DIAGNOSIS

In our experience the incidence of occurrence of this condition is not as high as found in some American series. Since October, 1942, however, we have encountered at the Winnipeg Clinic in the investigation of some 5,500 cases for symptoms referable to the biliary and upper gastro-intestinal tracts, 53 cases of hiatus hernia. Clinically, women predominated in the series, the proportion being three to two. Only three were under fifty years of age when the diagnosis was established.

The symptoms which hiatus hernia may bring forth are predominantly gastro-intestinal. This has been determined by the experience of various writers and is supported by a review of our own cases. As just mentioned there is considerable variation in the severity of the complaints, depending upon the status of the condition. Briefly the chief symptom noted in our series was distress following eating, especially heavy meals. Occasionally this was severe enough to be described as pain. Generally it was noted in the epigastrium or behind the lower portion of the sternum. The fact that pain is also sometimes brought on or aggravated by lying down while relief may follow rising or walking is perhaps typical of the condition and can be explained by the part posture plays in affecting the relation of the stomach to the hiatus. Pyrosis and eructations were present in almost all cases. Vomiting was not common but usually produced relief. One case of dysphagia occurred in which a small ulcer at the lower end of the œsophagus was accompanied by a hernia. This could be seen in the barium meals and was checked by œsophagoscopy. Harrington explains such a lesion on the basis of pressure by the herniated stomach against the lower portion of the œsophagus or the regurgitation of gastric contents into this part. Unfortunately neither the ulcer nor the dysphagia responded to the repair of the hernia in our case. Bowel disturbances were noted in only two instances where intermittent diarrhœa and constipation were associated with the presence of the transverse colon in the hernia. Peptic ulcer symptoms with the characteristic pain-food-relief syndrome were encountered only once although ulcer was an associated condition in five cases.

Generally the gastro-intestinal symptoms could not be considered urgent except in one of our cases where obstruction to the pyloric end of the stomach caused persistent vomiting and pain requiring early surgery for relief. In most cases the patients were stout and fear of food producing distress had not been sufficient to dampen their appetites. The symptom complex resembles that due to chronic cholecystitis. It is interesting to note that 13 of our cases had undergone cholecystectomy before a diagnosis of hiatus hernia was made and their symptoms had failed to be relieved in a satisfactory manner.

In two cases there was moderate retro-sternal pain referred to the left shoulder and arm suggesting angina but an examination of the cardio-vascular system was negative. Palpitation occurred three times, one case suffering attacks of paroxysmal tachycardia for many years, the electrocardiogram being considered normal for the patient's seventy years. No pulmonary symptoms were encountered in our series. The spasm of the diaphragm induced by the hernia may be associated with phrenic pain which is referred to the left shoulder and even into the arm creating a suggestion of angina pectoris especially if epigastric distress is also present. Interference with cardiac function by the presence of a dilated portion of the stomach is no doubt the explanation of the palpitation and tachycardia.

Anæmia has been stressed as an important condition resulting from erosion from external pressure upon the stomach wall. Our experience with this complication is found in three instances where severe and prolonged hæmorrhage brought the hæmoglobin to below the critical level of 40%, no other cause being apparent for the blood loss.

Hiatus hernia can be a problem of importance to the obstetrician. It has been pointed out that intractable pyrosis of pregnancy which occasionally occurs in the later months and which is not relieved by the ordinary gastric medications and usually aggravated by the recumbent position may well constitute a rarely recognized symptom of this type of hernia. Occasionally it has been reported that patients have died of strangulation of some viscus in such a hernia during labour. Of our cases only two women stated that their digestive symptoms were greatly exaggerated in the latter months of their pregnancies.

In the final analysis it must be admitted that there is no easily recognizable set of symptoms available for certain diagnosis of hiatus hernia. For the most part the roentgenologist must be relied upon to establish the cause of the symptoms. Therefore it is incumbent upon him at the time of the barium meal to rule out the possibility of this lesion as it so frequently is not suspected. This requires an examination of the patient while in the Trendelenberg position when some method should be employed to increase intra-abdominal pressure. No doubt this represents an increase in the time required for the procedure and therefore a further burden upon the roentgenologist. However, the additional findings as the result of this more complete examination should represent a worthwhile benefit. Because so many of these cases present a history suggestive of gall bladder disease a cholecystogram is the most likely roentgenological procedure to be performed in their investigation. From our experience cholecystitis is a common associate of hiatus hernia, occurring as it does frequently in older and obese patients; therefore this single finding so often does not tell the whole story and cholecystectomy may fail to relieve the patient if the hernia is undiagnosed and not corrected. For such a reason as this we have followed the principle that since in certain cases of upper digestive tract disease one condition may stimulate or mask another, or more than one lesion be present, the examination is not complete without both a barium meal and a gall bladder visualization.

Occasionally the roentgenologist may encounter what is known as a phrenic pouch or ampulla in the terminal portion of the œsophagus. This is merely a transient dilatation of that portion produced by deep inspiration (Fig. 3). Such a dilatation may be mistaken for a hiatus hernia. In a true hernia the gastric mucosa can usually be identified as it goes through the hiatus (Fig. 4). Doubtful cases should be reexamined, of course, and the differentiation is usually not difficult since no phrenic pouch is seen if the patient breathes normally during the passage of a bolus of barium.

We have not encountered a case of thoracic stomach associated with a congenitally short œsophagus. Where such a possibility exists œsophagoscopy should be employed in order that the length of the œsophagus can be determined accurately. Finally, a diverticulum of the lower end of the œsophagus might resemble a portion of the stomach above the diaphragm but absence of gastric mucosa and failure of the diverticulum to empty should establish the diagnosis (Fig. 5).

Fig. 3 Fig. 4

Fig. 3.—Examples of phrenic ampulla noted during ingestion of barium. **Fig. 4.**—Hiatus hernia with portion of stomach above diaphragm demonstrating differences in œsophageal and gastric mucosa.

TREATMENT

The treatment of hiatus hernia depends upon the severity of the symptoms. Patients who are

Fig. 5.—Diverticulum at lower end of œsophagus.

suffering intractable pain, frequent vomiting or anæmia, or who have a large segment of the stomach in the chest interfering with respiration or circulation, are candidates for surgery. Those cases where surgery is contra-indicated or where the symptoms are not marked may respond to medical management. Of chief importance here, is the problem of weight reduction, in order to lessen intra-abdominal pressure. Many patients are relieved in this way and by the use of small easily digested meals and avoidance of the recumbent position or stooping after eating. Several of our patients have stated that their distress may come on with the act of putting on their shoes.

a master thoracic surgeon. He stresses the importance of this method since it permits proper exploration of the abdominal cavity and correction of any additional pathological condition such as a stenosing duodenal ulcer or gall bladder disease. It would appear that surgery of the hiatus hernia has not yet become popular with the general surgeon. The possible explanation for this is that the condition is presumably one involving the thorax and as such should be left to the chest surgeon. This attitude undoubtedly should change since the war has revealed the mysteries of the thoracic cavity to many surgeons and the statistics have borne out the good results which followed their experiences.

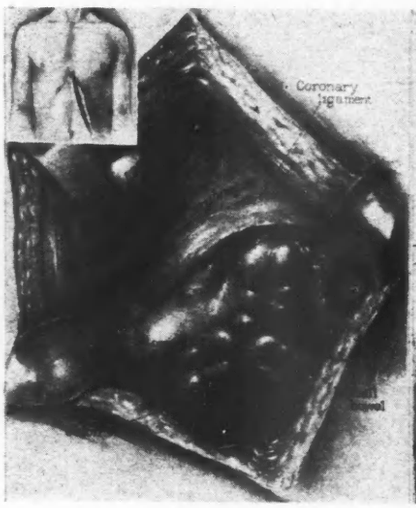

Fig. 6

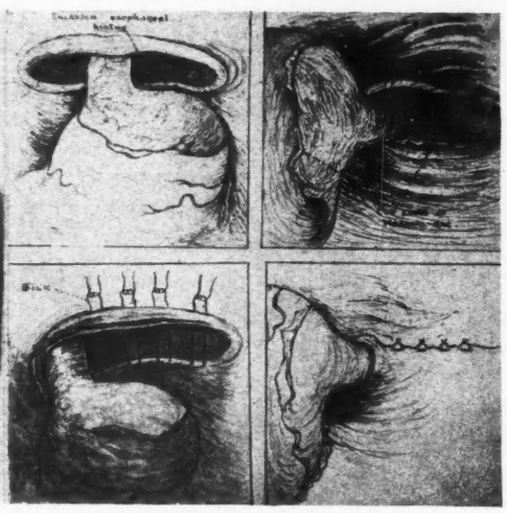

Fig. 7

Fig. 6.—Exposure of œsophageal hiatus. The left lobe of the liver is mobilized and retracted to the right. Stomach and colon are seen through the hiatus (after Harrington). **Fig. 7.**—Steps in closure of œsophageal hiatus hernia.

Of the surgical procedure left-sided phrenicotomy has occasionally relieved symptoms by paralyzing the corresponding side of the diaphragm. In this way the crura of the hiatus are relaxed and thus the possibility of incarceration is reduced. We have had experience with this method in only two cases, both obese and elderly, who obtained satisfactory results from such an operation combined with weight reduction.

The radical cure of hiatus hernia involves the reduction of the herniated abdominal contents and closure of the hiatus. Complete agreement has never been reached as to the method of approach. Sauerbruch, one of the leading German surgeons, favours closing the defect through thoracotomy. On the other hand, Harrington, at the Mayo Clinic, has had an unparalleled experience with this condition and prefers the abdominal approach despite the fact that he is

In the surgical treatment of our cases we have employed the technique of Harrington. A short period prior to laparotomy a left-sided phrenicotomy is undertaken with crushing only of the nerve. The object of this procedure is to immobilize the diaphragm temporarily on that side in order to simplify the repair of the hernia at later stage. This immobility also gives more assurance of proper healing when the enlarged hiatus should be closed. A day or two later the abdominal operation is performed under a general anæsthetic. Cyclopropane, more recently combined with intravenous curare, is administered through an intratracheal tube which permits control of pulmonary collapse should the pleura be accidentally incised. The usual incision is an upper left rectus one and through it the transverse and splenic portions of the colon are retracted downwards and to the right

and so maintained during the operation. The spleen is then drawn downward and held in place against the posterior abdominal wall. It is next necessary to divide the triangular ligament of the left lobe of the liver and retract the lobe folded upon itself. The stomach, if it happens to be herniated, at the operation is drawn down through the hiatus. The fold of peritoneum which is reflected from the diaphragm on to the stomach to form a sac is seized and excised from the edges of the crura and upper part of the stomach (Figs. 6 and 7). If this sac is permitted to remain the possibility of recurrence is present. The deperitonealized crura are now sewn together with interrupted heavy silk sutures, usually three or four being necessary. A final innermost suture is of chromic catgut which includes not only the edges of the crura but also some of the outer fibres of the wall of the œsophagus. This is a precaution against narrowing the œsophagus since any stenosis can be later dilated when the catgut is absorbed. In this matter we have employed Harrington's method of identifying the size of the œsophagus by the passage of an Ewald tube from above when the last suture is to be placed. The structures are now replaced and the abdomen having been explored at the outset, the incision is closed in the usual manner.

To date we have operated on 16 cases of hiatus hernia. Two of these received phrenicotomy only and the remainder were repaired according to the foregoing method. There have been no postoperative deaths. In one case associated with cholecystitis, gall stones were removed and the gall bladder drained at the time. In two cases splenectomy during the operation was necessary because of trauma to the capsule of the spleen. It is necessary to be on the alert for pneumothorax if the pleura be torn and its extent may be estimated by a chest plate taken in the operating room immediately post-operatively, and measures taken, if necessary, to correct it. For a few days after the operation continuous gastric suction may be employed to decompress the stomach while the patient's nutrition and water balance are maintained by intravenous fluids.

In two cases there has been no relief of symptoms; in one of these a persistent ulcer at the lower end of the œsophagus continues to produce dysphagia and in the other case symptoms suggestive of œsophagitis are associated with a small recurrence. No other cases of recurrence of the hernia are known and all have been checked by a barium meal following surgery and some of them ten to twelve months later. The great majority are free of symptoms and are satisfied with the results.

PSYCHIATRIC OBJECTIVES OF OUR TIME*

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I AM highly honoured to serve as the Louis Gross Memorial Lecturer of 1946, in memory of an erudite scholar and pioneering scientist whose original work on the heart is still considered the best of its kind. Ten years ago this evening's spectacle of a psychiatrist speaking to physicians in memory of a cardiologist would have been an impossibility. Yet, more than three decades before, Louis Gross seriously studied the dynamic psychiatry of his day and applied his learning to the treatment of neurotic patients, and shortly before his untimely end he sought to increase his psychological understanding by undergoing a personal psychoanalysis. In this too, Gross was ahead of his time and anticipated the importance of psychiatry in medicine.

It should not seem so strange for a cardiologist to be interested in his patients' feelings, because since antiquity the heart has been considered to be the most sensitive recorder of the emotions, and even to be their source. All of us experience our intense feelings, accompanied by sensations within the precordium and with activities of the heart. Indeed, idiomatic language refers various emotions to cardiac peregrinations or acrobatics. Your heart may rise to your throat, sink to your boots, pound, flutter or palpitate with fear. It becomes heavy or breaks with grief, contracts with apprehension, dilates with joy, enlarges with generosity and ossifies with selfishness. It can be lost or given away in love and run away, stand still or turn over with excitement. Only the poets have really done justice to the

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finer nuances of feeling entrusted to the myocardium. These expressions demonstrate how common knowledge crystallizes correct psychological concepts in idiomatic language and verse long before the ponderous advance of science, for physicians are just now approaching an understanding of the relationship of emotions to bodily functions. We are beginning to understand the unity of mind and body.

The relationship between mind and body has engaged the attention of philosophers and psychologists since man began to wonder about himself. The philosopher Spinoza first succinctly formulated the principle that mind and body were but two aspects of the same phenomenon. Men of medicine, however, persisted in their practical approach to the body as an entity separate from the mind, and in our modern scientific era of cellular pathology and microbic agents of disease, the separation of mind and body became practically complete. In fact, disease was considered a process within a single organ separated even from the remainder of the soma. But gradually the concept of disease is losing its provincialism and becoming a problem of the whole body. The most progressive holistic attitude in medicine approaches the disease within the man less and the man with the disease more. Ultimately an appreciation of the entire thinking, feeling, living mind-body unit is developing. Man has become a psychosomatic unity.

It is often said that nothing is really new; that modern discoveries are only rediscoveries of what our predecessors of the intellectual mediæval world had known by other words. The new researches in psychosomatic medicine seem to fall within this category because physicians have long known that emotional disturbances produce exacerbations of physical diseases. Patients with diabetes, peptic ulcer or colitis notoriously become much worse when under emotional stress, and contrariwise physical diseases tend to make emotionally disturbed patients more obviously neurotic. However, such phenomena do not represent the psychosomatic medicine of which I speak nor do they indicate the concept of mind-body unity of modern medicine. Our present day thesis is concerned with emotional etiology as the initial factor in a causal chain of functional events which may end in tissue disorganizations which we call disease processes.

To comprehend such a causality we must understand the often confirmed observation that subjectively experienced emotions are invariably associated with objective physical activities in structures innervated by the vegetative nervous system. There is no separation between these subjective and objective phenomena; together they constitute the dynamic mind-body process that we call feelings, affect or emotion. Often it is difficult to detect the visceral components, but with appropriate instruments they can be demonstrated and measured as alterations in intensity or rhythm of vasomotor, pilomotor, sweat, temperature, cardiovascular or respiratory activities. The major physical concomitants are specific to the special feeling and purposeful in the homeostatic processes of the living individual, often to prepare it for an anticipated stress or danger which has stimulated a warning signal of anxiety. Although normal feelings such as anxiety are partly subjective to indicate the organism's needs, or certain dangers to it, and partly visceral to prepare the internal economy for adaptation to the present or forthcoming change, the end-result of the emotion may be some form of somatic action which alters the relationship of the total organism to its environment. It attacks or runs away. It must obtain relief from the unpleasant visceral tensions raised within and, if needed, the striped musculature becomes the executive for total action. Neuroses or neurotic behaviour are likewise experienced by feelings and expressed by visceral changes, and finally by somatic action. The neurotic may complain of a depressed mood, or a cardiac irregularity, or an irrepressible asocial hostile activity; examples in which mood, visceral or striped muscle action predominate, but in all of them there is a detectable and measurable concomitant change in vegetative or sympathetic function. Obviously all neuroses and psychoses are accompanied by alterations in psychosomatic stability.

When feelings alone seem most disturbed the sufferer recognizes its nervous origin, calls it a "nervous breakdown" and consults a psychiatrist. When somatic action is expressed in abnormal behaviour the patient becomes asocial, entangles with the law and is considered psychotic, psychopathic or delinquent. When the visceral organs are intensely disturbed with only secondary apprehension, the

patient consults a general practitioner, internist, gynæcologist or surgeon. These patients comprise 50 to 70% of all medical practice and it is important to know how their troubles develop and what to do about them.

Through the environmental influences of our civilized society that impinge on most of us, we are conditioned early in childhood to suppress or repress from consciousness certain types of feelings and to inhibit the resulting somatic action. We are taught not to get angry and not to strike out in rage. We are forced to give up our childish desires and our expression of hunger for gratification on reaching the age when "growing up" is expected. With the threat of punishment and fear of loss of love, children are forced to repress their emotional hungers and their primitive angry reactions to painful stimuli or situations, or to frustrations. Therefore, all of us approach adult life with a reservoir of inhibited feelings considered as "wrong" or "sinful" and unacceptable to civilized society, and a backlog of unsatisfied immature desires to which we secretly cling with the greatest of inertia. None of us can escape. Many children receive too little gratification and have had too much pressure toward maturity. Such individuals are well prepared for psychosomatic disturbances. Others become exposed to later accidental life situations that surpass their capacities for adaptation and are forced to regress in refuge to earlier phases of emotional development. Whether the universal conflict between inner insecurity and external demands develops early and results in a fixation, on infantile, and hence neurotic, patterns or develops later and causes a regression, the direct expression and feeling of these childish emotions is prevented by well established internal checks and by the external environmental attitudes. What happens to these feelings? What outlet has this energy?

When no conscious feeling or expression is possible and somatic action is inhibited, only the visceral component of the emotion, which is not under control, is permitted activity. The result is a visceral expression of the feeling that cannot attain conscious recognition. But this inner activity is not of normal short duration or of low intensity; it persists for long and reaches a heightened intensity because the conflict is chronic and the nervous energy can only utilize the vegetative outlet. The result is an excessive visceral activity, usually limited to a specific organ, which causes an alteration of function appreciated by the patient as symptoms. If the inner conflict varies in degree or if the stress fluctuates in intensity, so does the symptom.

If the vegetative dysfunction persists for considerable time, tissue changes may develop and the stage of "physical disease" is reached and is detectable by the medical specialist. The demonstrable pathological process is the late end-result and can only be explained by its immediate precursor, the longstanding excessive "dysfunction". For example, gastric dyspepsia caused by hypersecretion, hyperacidity and hypermotility are the precursors of peptic ulcer. However, experience has shown us that chronicity may not be the only factor since dyspepsia may exist for years without ulcers and acute ulcers may develop in a few days without preceding gastric symptoms. There is some unknown plus factor. We may now establish a hypothetical chain of causal events that terminate in visceral disease.

1. Early demands or frustrations cause specific psychological patterns of excessive or too early inhibition of certain feelings.

2. Later life frustrations or stresses act on such a conditioned person or if intense (stress of war) on the most normal individual to increase the repressed needs or inhibited feelings.

3. Evidences of these activated or intensified needs or demands by symptoms of dysfunction of one or more visceral organs.

4. Irreversible morphological changes in the tissues after long standing functional disturbances.

These processes can be better understood if concrete examples are given. I shall present vignettes of case histories exemplifying hypertension, peptic ulcer, colitis and bronchial asthma although many other syndromes could be used as examples.

Mrs. S. was an extremely dependent and infantile person who was always dominated by a mother who believed in lady-like attitudes of pleasantness and imperturbability. No expressions of anger or resentment were permitted without evoking displeasure and tacit threats of loss of maternal love. In middle life, when her daughters became rivals for her husband's affection, the patient developed throbbing headaches which her physician discovered were the result of a functional hypertension. During uncovering psychotherapy, hypertension appeared when the patient was stimulated by a situation calculated to evoke jealous anger, but which she could not feel or express directly. Freeing her inhibitions permitted her to feel angry on appropriate occasions with diminution of her blood pres-

sure and a decrease of her overcompensatory submissive and dependent external attitudes. Insight later enabled her to master in some degree her clinging dependency that was basic to her jealousy and prevented her from maturing.

Mr. C. is a young business man who was closely attached to a dominating father who gave him little affection although much was demanded of him. The mother was ineffectual and incapable of giving the patient much love or feeling of security. The patient's parents died while he was still young. He entered his father's business in an aggressive fashion, working hard, taking many responsibilities and worrying greatly over his family. For many years he had dyspeptic symptoms which were increased during periods of greater responsibility and worry and when crucial business matters required his every effort. One night he was taken ill with a gastric hæmorrhage requiring an emergency operation which exposed a peptic ulcer. The subsequent course revealed a continuation of symptoms even while on ulcer management and their exacerbation when greater efforts or responsibilities were expected of him.

This man continually felt the need for love: he was hungry for that which had not been given to him in sufficient quantity. Thus his dyspeptic symptoms were due to hypermotility and hypersecretion of the stomach. His character represented a denial of his hunger for he became aggressive, responsible and independent. But the more intensely he worked, the greater his internal deprivation and need. The end result was a morphological change and secondary hæmorrhage. Under therapy he was given attention and affection and aggressive drives were decreased. The vicious circle opened up and he could accept gratification and appease his hunger.

Miss M. was a 19-year old child of a minister whose hypocrisy was easily discerned in his household. The mother was a weak, fussy compulsive person who insisted on regularity in eating habits, cleanliness and other ritualistic behaviour. The patient was the centre of attention until the birth of a younger brother whose good looks, and later charming personality, created great envy in his sister. At the age of four she developed attacks of diarrhœa that necessitated a return to diapers and maternal solicitude. This receded after a time but in adolescence any conflict with the mother would result in several days of diarrhœa. In this case the patient's envious hostility to the brother and resentment toward the mother could only be expressed through infantile soiling. Eventually secondary infection developed, requiring prolonged hospital treatment. Psychotherapy subsequently helped solve the primary conflict.

Mr. B. was a 31-year old asthmatic who was first seen in the medical wards because of severe uncontrollable attacks not relieved by large quantities of medication administered by mouth, by inhalations or intravenously. He seemed to be going steadily downhill and psychiatric consultation was only requested in desperation. The asthma had begun only four years before, after the father had died and the mother had taken in a female boarder to supplement the family income. This necessitated the patient's removal from his room and he was forced to sleep in the same bed with a hated younger brother who was the mother's favourite child. The patient was an extremely dependent boy who struggled all his life to attain great quantities of love and attention from the mother. This was obvious from a brief interview. The important facts for this exposition were observable at each asthmatic attack while the patient was on the psychiatric ward where all medication was stopped. With the establishment of a good relationship to one sympathetic physician, attacks occurred only under certain conditions. When the patient felt that he was slighted or rejected in some manner, no matter how minor, he reacted with asthma which, if unchecked could become extremely severe. However, if he were interviewed by his doctor and permitted, really encouraged, to express a combination of childish rage and cry for affection, the asthmatic attack would gradually recede. The attack could be aborted by the conscious understanding, through confession, that he was angry at the person he loved and needed. The fundamental problem of this man's dependent attitudes required considerable therapy and emotional education. The attacks themselves were visceral representations of feelings unacceptable to consciousness.

I have sketchily demonstrated a few psychosomatic syndromes. Their diagnoses are made not by the absence of physical changes because these may be present too as end-results. The diagnoses are made by careful psychological study of the characteristic external personality reactions and from the clues concerning the unexpressed unconscious conflicts. The question naturally arises; what have we learned to do about these conditions?

Wars have always been great catalysts for the development of science for its practical applications become apparent to everyone in those precarious times. Although these applications may be rapidly mobilized their existence is dependent upon many previous years of painstaking research and education. Yet all the money spent on all medical research in America during 1944 would only have paid the cost of eight hours and twenty minutes of World War II. From this war psychiatry made many advances in therapy stimulated by the necessity of speed in treating large numbers of casualties. During the war it was demonstrated to large numbers of people and many physicians that emotional disturbances have a tremendous monetary and human cost. Yet concerning these emotional disorders that comprise 50% of all human ailments the medical school curriculum only devotes 2% of its teaching time and that is largely devoted to a consideration of the relatively rare psychoses for which there is little therapy. Even in the services psychoses comprised only 5% of the psychiatric casualties. Psychiatry has now legitimately come to be considered much less concerned with "crazy people" than with disturbances in stability, difficulties in attaining maturity, unhappiness in interpersonal relations and with psychosomatic syndromes. These are now rightfully considered as neither shameful nor the source of inferiority feelings, but as involuntary residues of accidents of individual early training and childhood disasters, as well as unfortunate fortuitous stresses in later life. They cause the minor ailments of personality, maladjustment, excessive anxiety or depression and so-called functional ailments. The war has

proved that these are amenable to successful therapy, providing grandiose notions of reorientation of the personality, rebirth or other magical processes are abandoned and our sights are lowered to the practical objectives of improvement of interpersonal relations and the betterment in the internal psychological and visceral functions.

In the services *preventive* psychiatry was accomplished by systems of selection, proper classification in appropriate jobs, strong leadership and group solidarity. Similar procedures in civilian life require the wise utilization of aptitude tests followed by appropriate training, and skilled personnel men in industry who can place workers in jobs best suited for their particular skills. In the army individual weakness leading to neurotic reactions were neutralized by strong and competent leadership of closely knit groups motivated adequately for their common interests. Even in the military groups of a democratic nation the individual never was forced into a complete dependence upon the leader and to obey with blind obedience, but he always had an outlet for his own independence. The proper seasoning of these factors in civilian life will do much to preserve the stability of the weaker persons.

Active therapy has always been psychiatry's weakness, especially in comparison with the results of other medical specialties. Those physicians who believe in the unchangeable constitutional causes of neuroses, that neurotics are born to be "weak sisters", are completely pessimistic regarding the possibilities of therapy except by changing the environment to fit the patient's decreased capacities. Other doctors and the majority of the harassed patients search for drugs or surgical operations to produce some magical change without the necessity of co-operation by the patient in the work of learning new and better ways of handling old conflicts. For rational psychotherapy is lengthy, expensive and difficult for both the patient and the therapist. The great host of people suffering from psychosomatic disturbances need active psychotherapy, yet it is now available only to a few. There simply are not enough psychiatrists available to handle the psychoneurotics and psychotics who come to them directly. The others are undiagnosed or untreated and in increasing numbers develop tissue changes. At present we are attempting to train many more psychiatrists but the greatest burden will be on the general practitioner and internist to deal prophylactically and actively with early cases.

Concomitant symptomatic medical treatment is often necessary, but when successful it often alleviates symptoms temporarily and prevents insight by the patient into their psychogenesis. Such medication must be administered almost continuously and does get at the basic problem. However, medical or even surgical treatment is indispensable when structural changes have occurred. Furthermore, after long-continued intense anxiety has been endured, metabolic changes are detectable which seem to be irreversible even though the anxiety subsides. In these cases biochemical studies are essential and pharmacotherapy should be attempted. Unfortunately we are still ignorant of the essential processes and their remedies.

The essential and basic therapy is directed to the "first causes"—the psychogenic factors. Dynamic psychotherapy is used to uncover the repressed emotion and permit its direct expression in feelings, words and action thus overcoming the vegetative retreat. Such ventilation of the buried feelings through abreactions in group therapy, hypnotherapy, narcosynthesis or in simple interviews is only the beginning because the source of such feelings must then be uncovered and mastered.

Brief or flexible psychotherapy has been suggested as an effective means of making few psychiatrists available to more patients. But we shall never have enough psychiatrists to treat all the psychosomatic problems. In the military services young medical officers after brief training were capable of dealing with the simpler problems and could learn to use some psychiatric techniques adequately. In civilian life, general practitioners can be taught the techniques of preventive psychiatry and many procedures to be employed in early cases before calling in a specialist, just as they do in handling disturbances of the soma. Until more psychiatrists are trained and more internists and practitioners make time available and learn the treatment of psychosomatic syndromes we must use heroic short-cuts in therapy which can be applied by all medical men with little special training. One such method can be exemplified by the presentation of a single case treated briefly in a few sessions.

An ex-service man, aged 22 years, entered Michael Reese Hospital because of attacks of severe abdominal pain, and diarrhœa. These attacks had begun while in the army overseas and resulted in his evacuation to the United States and discharge. The last attack occurred while at home after a discussion with his father over funds for the purchase of an automobile for his own use when away at school. After thorough but negative medical investigation, the internist in attendance requested psychiatric consultation.

The patient was a well built, tall handsome young man extremely pleasant in his manners and interested in getting well. The father was an attractive dynamic proverbial type of successful executive who dealt in big business with rapid-fire decisions and continued the same behaviour in his life at home. His mother was a thin, unattractive somewhat complaining shadowy figure who had numerous abdominal operations and frequent attacks of diarrhœa. A younger brother of 17 was the only other member of the family. In telling of his family life the patient considered that there was nothing lacking, that everyone was good and nice. Although not effeminate, he gave the impression of considerable passive compliance and complacency in his attitudes. His war experiences were uneventful and not dangerous. He had been stationed in England for many months with a quartermaster company, functioning as a driver and had gone to France long after D-Day, never seeing combat. Only once had he been near danger and that was while driving through territory into which German paratroopers had penetrated. He had been a "little scared" but had never seen a German. His first attack of abdominal pain came on 10 days later while driving a car for his captain.

Because the patient could not remember any conscious emotional attitudes during any of his attacks of pain it was decided to attempt a reconstruction of the setting prior to his first spell and to uncover the feelings accompanying that particular episode. Accordingly pentothal was administered intravenously and the patient was told that he was driving his truck on the specific day on which he had been a "little scared".

The patient began talking fearfully of his hearing that German parachutists were in the neighbourhood into which he was ordered to drive. Suddenly his truck broke down near a hill from behind which shooting could be heard. By regulation he was forced to stay near his truck until help arrived, so after hiking to the nearest ordnance patrol he returned to the vicinity of his truck and sweated out relief in a fox-hole. For 45 minutes he remained here alone in abject fear, although he heard only distant shots. Under pentothal he disclosed his thoughts never before verbalized which were those of a little child pleading for God to save him. He was too young to die and besides he had been a good boy, never harmed anyone. What would mother do if he were hurt or killed? As he cried and pleaded to the Almighty for help he perspired and writhed on the bed and jumped at the slighest noises. As I listened to this first exteriorization of the old forgotten stream of thought there were missing all manifestations of courage and anger. Finally a relief truck arrived and the patient became more aggressive as he directed his fellow soldiers to turn their truck around. As they drove closer to the camp he actually became belligerent and when he saw the guards and machine guns in position, he verbally dared those bastardly Nazis to come this way, "We'll kill them like rats."

After the pentothal interview the patient remembered that he had been scared badly but had forgotten all about it. His fear was then dealt with as an understandably normal reaction and then in a state of emotional exhaustion he fell asleep. Subsequent interviews concentrated on "the little boy within the grown man" and the universality of the fear reaction. A few days later another pentothal interview was undertaken in the setting of the first intestinal attack 10 days after the parachute incident. The patient had driven all day long for his commanding officer, an alcoholic captain, who apparently mistreated his men and gave to himself the privileges of women and liquor although punishing his men for identical activities. The patient was his personal driver and often had to support the captain standing or walking, light his cigarettes and feed him when he was in a state of tremulousness. The captain's alcoholic gastritis and lack of appetite cost the patient many meals for himself.

On this particular day the patient had driven from early morning over badly damaged roads until late at night when they stopped at a tiny French village. The captain ordered the patient to bunk in the truck under the sky while he went into the M.P. station and slept under shelter. Our patient kept reassuring himself that there were no Nazi paratroopers nearby, they had all been cleaned out, that it was perfectly safe, "really perfectly safe", but in spite of this self-conducted psychotherapy he could not sleep for many hours. A few minutes after falling asleep he was awakened abruptly by severe abdominal pains and diarrhœa. When the pain became unendurable, he went into the M.P. shelter and sought out his drunken captain who ordered a soldier to take him to the medics. From this local station he was sent through the hospital system, in which he had repeated tests for organic disease or infection, and eventually was evacuated home. During this pentothal interview the patient groaned and writhed with his pains. He held his hands over the abdomen, and tachycardia, excessive perspiration and his sickly green colour left no doubt as to his suffering. He faithfully reproduced his initial attack in its entirety.

When he awakened we discussed the relationship of this attack to his fear at a second exposure to possible parachutists and his reaction to the captain who placed him in a dangerous position. He could not see why he should have felt resentful or angry toward the captain, and since there was a strong resistance against anything but the old "It was his right to order me as he wished" another pentothal was given in a few days. This time the patient was placed again in the village square in the dark and urged to express how he felt toward his captain. After considerable resistance, anger then spilled forth freely and completely. It was documented by countless incidents of discrimination, unfairness, lack of promotion, overwork, etc. The consciously passively accepted captain become a strongly hated person who took every advantage of his authoritative position.

After considerable abreaction the patient was interrupted and asked " and how about your father?" The answer was a surprisingly frank and abrupt, "He's the same kind of a guy." In the present tense, he then verbally lived through an event of some years past before entering the army. I shall summarize the lengthy but emotionally highly charged abreaction. Once when the father was absent from home, the patient's fraternity held a convention in Chicago and because transportation was scarce, against orders, he borrowed his father's car. While away from home his pet dog had also disobeyed house rules and scampered upstairs into the father's room where it had vomited on a costly rug. On his return the father was very angry and called the patient before him to receive orders for the following punishment; he had to be in the house each night at 6.00 p.m. after high school and could not leave for any purpose thereafter for three months. I could only hear the patient's responses and not the father's angry accusations and directives. The patient admitted his guilt, gave his reasonable excuses and mildly expostulated against the severity of the punishment. "Don't you think it is too severe—yes I'll take it like a man and not complain", although under the pentothal he sobbed pitifully. Ten weeks later the father was drunk one night and broke the punishment himself by asking the patient to drive him to his club. He invited his son to have a drink with him at the bar and in a maudlin sentimental fashion admitted that the punishment had been overly severe, admitted that patient had taken it like a man and asked for forgiveness. They shook hands and the affair was over. But during this pentothal the patient gradually worked up into a real angry attitude toward the father which was expressed for the first time.

These emotions were remembered, and discussed after the pentothal had worn off.

Subsequent psychotherapy was directed toward differentiating between infantile conscious appeasement with unconscious intestinal expression of rage, and adult and manly normally expressed justifiable anger. Obviously this was but one episode from a life long pattern. The father at first denied to my questioning any arbitrariness in his attitude. But his wife refused to let him avoid the issue and contradicted him at every turn. She and the boy had been compelled to bolster their defenses by alliance against the overstrict enemy and watch always for his weak spots. The father was a boss in his home as well as in his business and issued executive orders to his family or answered requests by a blunt "no" without giving reasons or qualifications. In this manner he wished to "make a man out of my boy" but actually he permitted no manly semblance of equality, forcing only an infantile obedience and appeasement. Normal emotional reactions could only be repressed. Confirmation of this principle was soon forthcoming as the boy made his first attempt to express his new-found independence, but the father was sufficiently disturbed at least to act the part expected by the psychiatrist. The result of therapy so far has been good in that there has been no relapse and the father has developed more respect for his avowed successor. The final outcome will depend on the life situations of the immediate future and will determine whether this brief therapy has been enough or whether further psychotherapy will be necessary.

This case has been presented in some detail to demonstrate the principles of procedure in brief psychotherapy of acute psychosomatic states. It demonstrates the processes of uncovering the repressed emotional content directly produced by the precipitating cause of the neurosis and its relation to earlier patterns. This patient showed quite clearly a combination of fear, rage and dependent crying expressed in a psychosomatic symptom. The working through and the reorientation of the patient's concepts of maturity as well as that of his human environment are demonstrated.

But this occurred in a young plastic person with little defensive rigidity. His environment had not yet hurt him too badly. We are less fortunate in our brief psychotherapy when dealing with middle-aged people who have long been habituated to chronic neurotic patterns and have become fixed on the organic nature of their somatic symptoms. For most, it must be sufficient to give them insight into their inexpressible needs and feelings and to teach them to recognize the environments in which their needs can be met and those which must be avoided because they stimulate unhealthy feelings. It is surprising how often such simple therapy is successful. It is a kind of therapy that can be employed by the general practitioner. It is identical with that which the old family doctor used so well with his intuitive knowledge of his patients' capacities and patterns of interpersonal relations.

Obviously therapy can be most effective at the developmental level by giving the child the full feeling of the security of being loved, by not inculcating into him fear and guilt in the name of sinfulness. His maturity can only be achieved by these methods and by the training of expression of aggressiveness into constructive social tasks rather than its repression and the inculcation of honest ideals capable of being met by a human being. This is a problem of sound parental upbringing and pedagogy. It is a mental hygiene, a prophylaxis in the true sense of the word for which we now have sufficient backing in theoretical knowledge and practical directives but unfortunately not the teachers or leaders to use them.

The stress of war exposed the weakness of the integration of the human personality and in its devolution the causes of its faulty structure were clearly exposed. A tremendous cross section of the male youth of our country have developed with weakened capacity to deal with frustrating reality, and matured with deficient or corrupt ideals. They remained emotionally immature. The causes were disclosed to be the frequency of broken homes, unwanted children and disturbed interpersonal relations among the parents. Sadistic and over-religious attitudes, alcoholism and corrupt ideals wreaked their toll in disturbing the personality development of the children who later became war casualties. Could this be altered by the treatment of a few private or clinic patients? Obviously not! What then is the solution?

Many psychiatrists returned from military service with the idea that adequate and widespread education of parents and teachers and through them education of children for a happier and peaceful life should be the line of direct attack on the problem of neuroses. Teach the parents and the children a way of life that would be more realistic, less corrupt and based on greater confidence in love, order and stability. This is indeed an enormous task made doubly difficult by the incredible stupidity and neuroticism of present teachers and the political corruption of our educational systems. There are too few people of maturity and stability to entrust with the task. It is like trying to dry one's self with a wet towel. The magnitude of the task categorizes it definitely as a social and not a medical problem.

It may seem strange that psychiatrists of our time should have as one of their major interests, the larger social problems that involve groups of people and their relationships. For medical men to have political and social interests seems a far cry from the traditional functions of the doctor, but thinking persons will realize that the psychiatrist, above all, must be concerned in the larger implications of emotional tension. The psychiatrist's day by day therapeutic work with a limited number of patients can hardly do much to prevent neurotic outbreaks of mass aggressions culminating in the tragedies of war. Can he apply his knowledge of the neuroses of individuals to those of nations that lead to war and reverberate back to disturb the individual's peace of mind? Let us consider the problem.

Psychological adaptation to frustrations and to interpersonal difficulties are learned and are largely based upon conditioning of responses through early environmental experiences. Cultural influences crystallized in the attitudes of the child's human environment are at first external forces that play upon him but soon become precipitated and work within him. They permanently determine his responses to later life situations and set his ethical and moral standards of behaviour, deviations from which produce severe anxiety. In each individual, early conditioning creates within him a fairly stable attitude toward aggressivity and passivity, right and wrong and a host of other ethical polarities. However, culture is dynamic, environmental attitudes shift and political and economic conditions change rapidly. Such changes may plunge individuals with contrary orientations into conflict with their new emotional environment and those who are less plastic suffer from internal anxieties and guilt which are manifested by disturbances in feeling, in visceral disorders or by shift in aggressivity or passivity. For example, those who wish for and still think in terms of a "return to normalcy" of the pre-war era are fixed in the past and are in conflict with the progressive present. To some degree in all of us there is an inertia of thinking, feeling and a strong resistance to change. Likewise, in all of us, there is a compulsion toward repetition of previously successful patterns, a defense against learning, and a tenacious hold on early attitudes crystallized within us.

It seems apparent that rigidly inculcated dogmas and fixed attitudes of right and wrong toward external conditions may be helpful or satisfying in creating an illusion that we know where we stand in a world of mystery and uncertainty but such attitudes lead to trouble in the dynamic processes of living. Little help can be anticipated from an educational system which imposes the rigidity of today's ideals and attitudes on the inheritors of the future. General Chisholm pointed out that today's soldiers were educated to avoid danger and imbued with the motto of "Safety First". They were then forced into situations requiring aggressivity, dangerous living and attitudes of safety last. No wonder many of them developed neuroses in the setting of war. Should we teach then today's children to be aggressive and to devalue individual lives? If we do, we teach them attitudes that are bound to bring us into war. Shall we again teach softness, complacency and unpreparedness in the name of the wished-for good life of a one world? If so, we prepare them for destruction by the more aggressive. It is indeed difficult to determine what mixture of internal ideals to inculcate in the individual to insure the most satisfactory adaptation in a competitive life among other individuals or nations. One must take into account the host of other countries whose educational processes have a contrary goal. The psychiatrist finds that education for peace of mind may be successful through proper training of the individual but that peace in the world requires universal mass education of large groups of people in all nations. Any solution must be world-wide and affect all for no one is safe nor can anyone feel secure as long as murderous aggressions are taught as permitted ideals in any group of people.

It is a moot question whether stress is less in the peace that follows a war than during the struggle itself. During the war, it was not ideas nor ideals that protected the individual against anxiety and welded him with others into effective combat groups. It was not ideals and peace aims that held the allies into a group solidarity, but it was a common danger that made each nation fight alongside other nationals against the common enemy. But these bonds soon fell apart when the danger was over and the individual crystallized out of the combat group, and the nations out of the United Nations with precipitate suddenness. It seems as if there must be a common enemy to create an effective group spirit and to cause egoistic interests to be mastered. Today the world has

no real or effective common enemy and whether we study individuals, trade unions, political parties or national blocs, we observe no common goal, little in the way of unselfishness and little apparent cohesion within our society. In America today we find unrest, pessimism, mistrust and despair, apparent in the actions, speech and attitudes of frightened little men all over the nation. The stronger these tendencies grow, the greater will be the cry for dominant and inspiring leadership. A tragic need and a dangerous cry indeed, for they are the beginning of a cry of a dependent people for a Fascist society.

We know that children mature to an adult state and thrive best as adults when they have sufficient gratification of their dependent needs and an adequate outlet for aggressive independence. Society also prospers best when these two needs are gratified. In nations where dictatorship flourishes, the state acts as a father on whom its citizens are dependent, gaining security in exchange for a reasonable amount of work. No aggressions are permitted within the national family, but they must be reserved for aggressive war on weaker nations. In German, Italian or Russian dictatorship, the concept of a master race is necessary to further the aggressive outlet on the inferior or socially misguided nations. Each dictatorship demands a world-order dominated by a master race or a sovereign people and there is little choice among them. The inevitable outcome of the dictatorship solution for satisfaction of man's need for security and for his aggressive drives, is war. American democracy has flourished in the past because its citizens' aggressive trends could be expended in the pioneering across frontiers of wilderness and in hemispheral "missionary" exploitation, but today in America there are no frontiers and our exploiting days are over. If there is no external expansion and we develop a stabilized economy, what then happens to our aggressions? If atomic energy is directed into industry and replaces our present uneconomical sources of energy, man's work time will be sharply reduced. What then happens to his aggressive drives that have never been but partially subsumed in his work for livelihood? Can these aggressions be displaced and constructively sublimated into cultural pursuits, or will man then destroy himself? Must we agree that man has always lived beyond his capacity to deal with his own aggressions and requires periodic wars to unleash their forces and save him from the unendurable distress arising from their internalization?

Your famous psychiatrist, Chisholm, whose greatness I fear Canada does not recognize sufficiently, has attempted an answer. He pleads for security from want and a temporary forcible prevention of aggression while the necessary education for maturity is effected in large groups of people. Chisholm rightfully states there are not enough mature people in the right places, instead immature, fearful, guilty and inferior feeling persons whose only solution to conflict is aggression. He asks for education toward maturity, adaptability and tolerance minus the rigid dogmas of right and wrong and sin.

Perhaps there are decent and constructive solutions but they must come from an understanding of man's psychological nature, not by treaties, power politics, political blocks or even moral or ethical dictates. Man can function well in loosely organized groups under respected leadership and when loyalty within the group is stimulated by common interests. Groups within which there lie security and independence in proper proportions develop intense morale, efficient performance and reasonable satisfaction for all. These facts we know from the study of combat groups in battle. What is the force that initiates the group and keeps it intact?

Fear of a common enemy has been that force under conditions of stress. It is fear that drives family groups, minorities, or even nations into alliances. But what fear short of war can weld men all over the world into groups motivated against war? So far we have seen that no fears have been successful in times of peace as yet, nor any intellectual ideals, morals or ethics yet developed. This sad state of affairs exists because we have not become conscious of the most terrible enemy of man, an enemy to be feared by everyone and one threatening with atomic weapons to destroy the entire world. Our common enemy which we have not recognized because of our false notions of man's volitional control, is his own aggressivity. We must know much more about this enemy, his sources and resources, his hiding places and disguises, his weapons and subtle strategy. We must learn how to disarm him and divert his energies into constructive chan-

nels as our slave and not our master. This we must teach everywhere at all times. We must use fear just as we threaten the child, though subtly, and develop in him fear of loss of love if he does not succumb to the early attempts at domesticity imposed upon him by the family. As to the growing child the threat must be at first implemented by force that serves to drive the inhibition inward as an internalized conscience. Similarly an international conscience must be created before we can develop a peaceful one world.

Such are the psychiatric objectives of our times; to develop people to healthy psychological maturity with inner satisfactions and peaceful interpersonal relations. We hope to teach man to fear his own aggressions so that he may face and master them not in uneconomic and crippling neurotic ways, but in constructive directions. Prevention of neuroses must be accomplished by education. Once developed, individual neuroses must be recognized early and treated by adequate rational therapy. Psychiatry strives to have therapy of psychosomatic disturbances utilized by all men of medicine and not only by a few specialists.

The magnitude of the problems that confront us in dealing with the emotional disturbances of individuals, nations and the world is tremendous and its complexity seems baffling. No single group of specialists can prevent or cure the psychological ills of the person or his world. All sciences, all nationals, all men must strive for the goal of maturity and freedom from the unhappiness and destructiveness of immaturity and its accompanying symptoms. It is our only hope!

RÉSUMÉ

L'homme est devenu une unité psycho-somatique. Les névroses et les psychoses s'accompagnent de changements dans l'équilibre psycho-somatique et amènent parfois des dégâts organiques irréversibles. Nous atteignons tous l'âge adulte avec plus ou moins d'inhibitions affectives et de désirs inassouvis. Ces inhibitions et ces désirs donnent lieu aux *symptômes*, très souvent d'expression viscérale. La persistance des symptômes amène des altérations tissulaires et on parle alors de maladie *physique*. Le diagnostic d'un état psycho-somatique s'obtient par l'étude psychologique soigneuse des conflits refoulés et de la personnalité du sujet. La thérapeutique, préventive ou curative, s'exercera à combattre les psychiques, à les découvrir, à les corriger et à donner un cours normal aux émotions inhibées. Le traitement, confié de préférence à un psychiâtre, aura pour but ultime de promouvoir une psychologie normale, d'apprendre à l'homme de craindre ses propres aggressions. Des exemples caractéristiques illustrent admirablement l'exposé de la médecine psycho-somatique.

JEAN SAUCIER

ANTIHISTAMINE DRUGS*

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THE advent of a new and promising drug often leads to its over enthusiastic and uncritical use by both the laity and the profession. During the past year the lay press and the radio have given widespread and exaggerated news of a new "cure-all" for the various allergic diseases. Unfortunately this occurred before the drug became available in Canada and before many physicians had even heard of the new antihistamine compounds. There are now many excellent reports in the literature[3, 5, 6, 9] and many physicians have had the opportunity to observe the effects of at least one of these drugs, benadryl. These compounds have been shown to have certain definite therapeutic effects and their toxicity is becoming appreciated through not fully evaluated. For these reasons we have thought it timely to review our present knowledge and to report our own very limited experience.

The clinical conception of allergy developed, early in this century, from the observations made in experimental animal anaphylaxis. While there are many differences between allergy, as we know it in man, and experimental anaphylaxis there are certain common characteristics.

In 1911, Dale and Laidlaw showed that the immediate symptoms of induced anaphylaxis in animals were to a large extent the same as those produced by the administration of histamine. In 1927, Sir Thomas Lewis showed that the various reactions occurring in the skin in response to intradermal injections were the same as those produced by intradermal injection of histamine. He suggested that such reactions were due to the liberation of histamine or a histamine-like substance (H substance). In the same year Best and McHenry established that most living tissues contained histamine. In 1942, Halpern produced bronchospasm in man and in guinea pigs by histamine aerosol. Time does not permit an adequate review of the vast amount of experimental and clinical observation on histamine and its relation to

* From the Department of Allergy in the Division of Medicine, The Winnipeg Clinic.

anaphylactic and allergic phenomena. The comprehensive reviews of Dragstedt[1] and Selle[2] are recommended. However it can be said that it is now widely, though not universally, held that histamine is at least one of the substances producing the manifestations of anaphylactic shock and possibly of allergy. It is believed also that while histamine is present normally in all tissue it is not free but bound and that it is liberated into the blood and lymph by the antigen-antibody reaction. It is probable too that other substances are also liberated including possibly heparin and a choline.

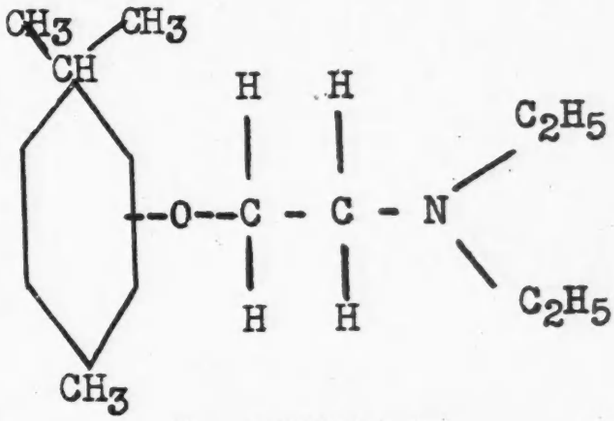
The treatment of allergic diseases is both specific and symptomatic. Specific therapy involves the removal of the antigen from the patient's environment or hyposensitization. Symptomatic therapy in allergy consists mainly in counteracting the effects of the allergic reaction. As these effects appear to be similar to or identical with the pharmacological effects of histamine the problem of relieving allergic symptoms becomes one of finding a substance which antagonizes histamine.

Until now the two most useful groups of antihistamine drugs have been (*a*) *epinephrin* and its related sympathomimetic drugs and (*b*) the *xanthines*. The former acted as an antispasmodic to smooth muscle and tended to counteract the increased capillary permeability caused by histamine. Its powerful clinical effect is too well known to warrant further discussion here. The xanthine group including theobromine, caffeine theophylline and aminophylline (theophylline ethylenediamine) acted by relaxing most smooth muscles other than those of blood vessels. They have been shown to be effective in relaxing the bronchial musculature of man when constricted by histamine or asthma. These drugs have been effective by reason of their own direct pharmacological activity and may not have been strictly antihistamine in the sense of directly interfering with the action of histamine.

In 1930, Best *et al.*, discovered an enzyme, diamine oxidase, or *histaminase* which when incubated *in vitro* with histamine, in the presence of oxygen, destroyed it. This reaction was slow *in vitro* and required several hours but was thought to be more rapid *in vivo*. It was used in animals by injection but preparations could not be purified adequately and there were some toxic side effects. However, it appeared to be active in the body. When administered by mouth it is destroyed by digestion and is therefore inactive. Attempts to use it clinically were unsuccessful because it could be given conveniently only by mouth. Its clinical use as an antihistamine drug has therefore been disappointing although further purification may make its parenteral use possible in the future.

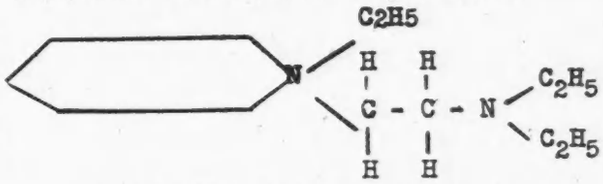
In the period 1937-39 several amino acids, arginine, histidine and cysteine were found to have the property of inhibiting or suppressing the histamine contraction of guinea pig intestinal strips and also of inhibiting the reactions of sensitized intestinal strips. However, relatively large amounts of these amino acids were required and as they are toxic in the higher doses required they were not effective in preventing anaphylactic shock in animals. The importance of these observations was chiefly in the opportunity of studying the possible mechanism of histamine antagonism.

In 1933 Fourneau and Bovet demonstrated that certain phenolic ethers had the ability to counteract the action of histamine in animals. The most effective of these was compound 929F.



Thymoxyethyldiethylamine

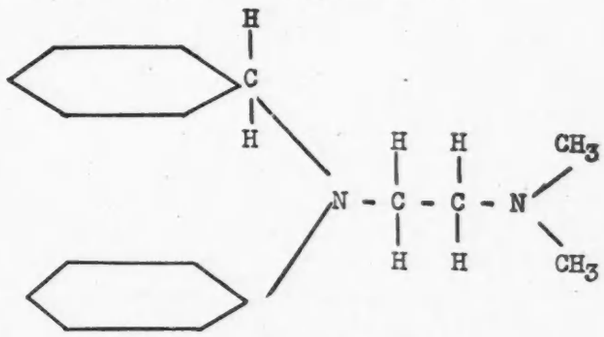
In 1937, Staub and Bovet reported that this substance was effective in preventing anaphylactic shock in animals. However, these phenolic ethers proved to be too toxic and Staub developed another series of the Fourneau compounds having the ethylenediamine radical. The most effective of these was compound 1571F.



N-phenyl-N-ethyl-N-diethylethylenediamine

Unfortunately these two drugs were too toxic when tried therapeutically and were abandoned.

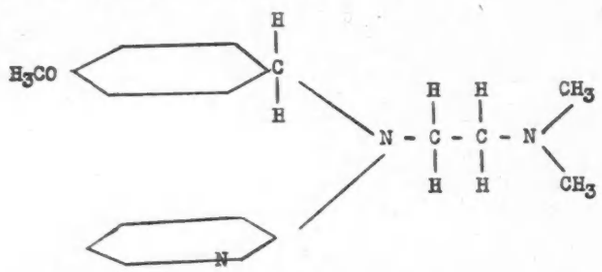
In 1942, Halpern in France developed a new series of related drugs and of these the most active as a histamine antagonist was compound 2339RP.



Dimethylaminoethyl-benzylaniline

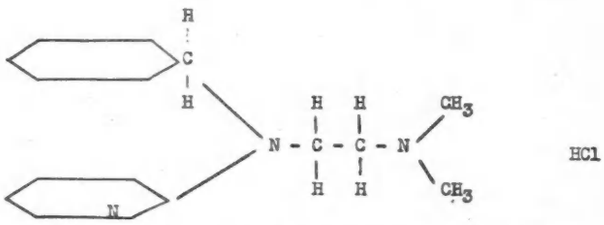
This drug received the trade name of antergan in France and it was used clinically with some success and was widely reported in the French literature. More

recently Bovet *et al.* have used a new derivative neoantergan (2986RP).



Neoantergan is still less toxic and more effective clinically. Halpern has developed further antihistamine drugs which are not yet reported but which he thinks are even more potent.

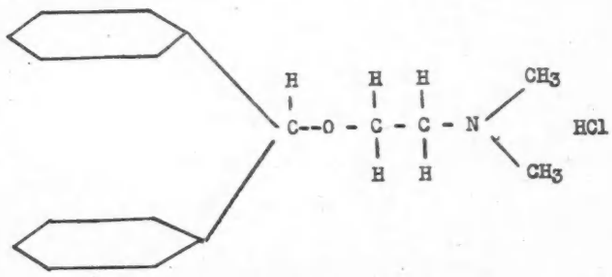
In the past few years the search for antihistamine drugs has been greatly accelerated on this continent. Mayer and his associates have developed compounds of pyridine derivatives and the most promising has been compound 63 or pyribenzamine (Ciba).



Pyridil-N-benzyl-N-dimethylethylenediamine hydrochloride

The close relationship between this and compound 2339RP is apparent and differs only in the substitution of the pyridil ring for the phenyl ring. This slight structural alteration of the chemical structure appears to increase its antihistamine potency and therefore lower the required dose. It is even more closely related to neoantergan in that the methoxy group is removed and the hydrochloride added.

In 1945, Loew and his associates reported studies with another group of synthetic compounds. These were the benzyhydryl alkamine ethers and the most promising of these was labelled A524 and called benadryl.



Dimethylaminoethyl benzhydryl ether

They showed that this substance was very effective in preventing anaphylactic shock in guinea pigs and that the mortality and shock produced in guinea pigs by intravenous injection of histamine was materially reduced. These findings, of course, constituted additional evidence that the chief symptoms of anaphylactic shock are referable to histamine. They also showed that fatal bronchoconstriction could be induced in guinea pigs by inhalation of histamine aerosol and that A524 was able to prevent or alleviate this reaction. Halpern, earlier had shown that bronchospasm could be produced in both man and guinea pigs by use of histamine aerosol.

CLINICAL EXPERIENCE

The French preparations antergan (2339RP) or neoantergan (2786RP) are not available on this continent, so far as we know, but there are many references to their effectiveness in the French literature.

In the United States, compounds 63 and A524 have been extensively studied, clinically, and reported on. The former, produced by Ciba and with the trade name of pyribenzamine is not, as yet, available to the profession. The latter has been on the market under the trade name of benadryl for several months. It is manufactured by Parke-Davis and Co.

The reports of many observers indicate that the therapeutic effects of both drugs are very similar though they differ in their toxic manifestations. Benadryl's most outstanding toxic effect has been drowsiness and lassitude, while pyribenzamine toxic effects have been similar but less marked.

Clinically the most outstanding therapeutic benefits have occurred in urticaria and angioneurotic œdema. Relief in up to 80% of these cases has been reported although the effect is temporary and lasts from six to twenty-four hours. The symptoms of itching in atopic dermatitis has also often yielded to treatment with benadryl and has proved to be a great boon in the management of such a distressing condition.

Allergic rhinitis, particularly pollinosis, has been relieved by benadryl in 60 to 75% of cases, however its use in bronchial asthma has been disappointing and the asthmatic symptoms sometimes become worse.

MODE OF ACTION

Pharmacological observations on animals and man strongly point to the supposition that benadryl and related drugs act as direct histamine antagonists. It has been suggested by Wells and others that these substances have a greater affinity for the receptor mechanism at the sites of action than histamine. That is, their action is competitive with histamine and probably quantitative. These drugs do not cause peripheral vaso-constriction and therefore probably do not act through stimulation of the sympathomimetic system as does epinephrine. There is no evidence that they act by interfering with the production of histamine. Certainly in experimental anaphylaxis they act as powerful histamine antagonists. However,

allergy and anaphylaxis are related but not identical phenomena and it is not certain that the histamine theory accounts for all the allergic phenomena. In any case it is noteworthy that the drugs of this series have marked effects in some allergic reactions such as urticaria and little or none in allergic asthma.

The antihistamine drugs also have many side effects especially on the nervous system. Local anæsthesia occurs on direct application of benadryl to a mucous surface such as the tongue. Drowsiness is frequently encountered and in many cases there is a marked cloudiness of consciousness as evidenced by sensations of floating or a feeling of being suspended. These sensations are reminiscent of hypnagogic phenomena. The fact that these drugs have such marked constitutional effects, other than their observed antihistamine effects, points to the possibility of their therapeutic effects being other than antihistamine in some instances.

Therapeutic effects are observed usually within an hour of taking the drug by mouth and toxic effects are equally prompt. Therefore, although our observations extend over a period of only eight months and include but eighty allergic cases, we feel that they indicate reasonably accurately the clinical properties of benadryl. Table I summarizes the classification of the cases with the results of benadryl administration. In most cases it was given while allergic studies were being made and before specific therapy could be undertaken. In some with an uncertain etiology it was used as a symptomatic measure.

There are several references to the successful use of benadryl in migraine. As shown in Table II, we used it in three cases with marked benefit in two and none in the other. Case 2 (J.E.) was finally able to control her migrainous attacks by taking 100 mgm. when her premonitory aura appeared. If the action of benadryl is really anti-allergic its effect in migraine points to an allergic etiology in these cases.

TABLE I.

Diagnosis	*Relief of symptoms with benadryl*					*Toxic effects*
	No. of cases	*Marked*	*Moderate*	*Slight*	*None*	*No. of cases*
Migraine	3	2	..	..	1	2
Urticaria	11	9	1	1	..	6
Atopic dermatitis	6	3	..	1	2	4
Contact dermatitis	1	1	..	..	..	..
Allergic rhinitis:						
(*a*) Seasonal	18	16	..	2	..	14
(*b*) Perennial	17	15	..	..	2	12
Asthma and allergic rhinitis	18					
(*a*) Nasal relief	..	11	1	..	6	8
(*b*) Asthma relief*	..	..	..	..	12	..
Asthma**	6	..	..	..	6	3
	80					49

*Six of these cases were not having asthmatic symptoms at time of benadryl trial. Two cases had severe intensification of asthma under benadryl.
**Two cases became very much worse with benadryl.

REPORT OF OUR CASES

Our experience here is rather limited and dates from January, 1946, when we were given a small supply of benadryl by Parke-Davis and Co. for clinical trial

There are now many reports of the valuable effects of benadryl in urticaria and angio-

TABLE II.
EFFECT OF BENADRYL ON MIGRAINE

Case	*Age*	*Sex*	*Duration*	*Daily dosage mgm.*	*Side effects*	*Results*	*Remarks*
J.B.	39	F.	2 yrs.	150	Not noted.	No relief	Cause not determined.
J.E.	25	F.	1 yr.	50-200	Drowsiness, bad taste, dizziness, palpitation slight muscle twitching and dry mouth.	Marked relief	Relief in 2 hrs. Side effects with max. doses. Migraine controlled.
E.V.	20	F.	8 mos.	150	Drowsiness	Marked relief	Food allergy. Relief in 1 hr.

neurotic œdema and our findings in 11 cases would support these observations. Table III gives these findings in tabular form. In these cases the almost intolerable itching made the patients most grateful for the symptomatic relief offered by the drug although toxic effects of varying degree occurred in 6. In most of them the offending agents were discovered and further attacks prevented. It is noted that in one case with coexistent asthma, the hives were immediately relieved but the asthma was unaffected.

We found that the itching in atopic dermatitus was greatly benefited but the dermatitis was often only slightly improved. Toxic effects were found in four of six cases and in one were so severe that the drug could not be used. In one case of contact dermatitis marked relief

TABLE III.

URTICARIA AND ANGIONEUROTIC ŒDEMA

Case	*Age*	*Sex*	*Duration*	*Daily dosage mgm.*	*Side effects*	*Results*	*Remarks*
A.S.	36	F.	7 days	100-250	Drowsiness, dizziness, nausea	Marked relief	Caused by injection of crude liver extract. Relief in 30 min. lasting 4 hrs. Subsided 2 weeks on stopping liver.
N.C.	30	M.	1 yr.	50-200	Drowsiness	Insignificant	Food and emotional factors. Possibly some improvement on drug. Recovered on elim. of wheat from diet.
R.S.	32	F.	Recurr. 6 hrs.	50-300	Drowsiness, dry mouth	Marked relief	Severe giant hives and swollen joints. Relief began 4 hrs. Perm. relief by food and aspirin elimination.
E.L.	32	F.	14 yrs.	50-150	Drowsiness, dizziness	Marked relief	Relief in 30 min. Permanent relief by food elimination.
L.E.	28	F.	3 mos.	100	None	Marked relief	Food and emotional factors. Relief from irritation in 10 minutes, controlled by diet.
B.M.	19	F.	2 days	50-350	None	Marked relief	Relief in 1 hr. Acute: No previous attack. Cause not known.
M.S.	23	M.	15 yrs.	50-150	Dizzy and weak	Marked relief	Immediate relief. Cause not known.
J.B.	32	M.	8-9 mos.	100-500	Light headedness	Marked relief	Food and nervous factor. Urticaria modified but not controlled entirely.
M.D.	55	F.	3 yrs.	150	Not reported	Marked relief	Probable milk allergy.
R.M.	39	F.	2 days	150	None	Marked relief	Drug sensitivity (Soneryl) immediate relief. No effect on asthma.
W.R.	33	M.	1 day	500	Nervousness, slightly drowsy, reduction in urine output and some burning	Moderate relief	Acute—cause uncertain—no previous symptoms. Itching relieved wheals continued and arthrosis of small joints of feet developed.

TABLE IV.

ATOPIC DERMATITIS

Case	*Age*	*Sex*	*Duration*	*Daily dosage mgm.*	*Side effects*	*Results*	*Remarks*
G.O.	62	F.	2 weeks	150	None	Marked relief	Immediate. Relief of itching.
F.O.	28	F.	2 yrs.	100	None	No relief	Emotional factor.
G.J.	57	F.	2 yrs.	150	Drowsy, muscle twitching, indigestion, irritability, palpitation.	Marked relief	Marked relief of irritation but unable to continue drug because of side effects.
B.B.	26	F.	4 yrs.	150	Dizzy and drowsy	Slight relief	Decreased irritation but rash unaffected. Hay fever present but not improved.
Y.H.	18	M.	2 days	100 prn.	Drowsiness	No relief	Chemical factor (Benzyl Benzoate).
S.H.	60	F.	2½ mos.	150	Drowsiness	Marked relief	Relief of irritation and swelling.
CONTACT DERMATITIS							
H.T.	71	M.	10 days	150	None	Marked relief	No contact agent determined. Relief of irritation and œdema.

of symptoms was obtained without any toxic effects. These cases are summarized in Table IV.

Beneficial effects were noted in a large proportion of our 35 cases of allergic rhinitis, both seasonal and perennial in which benadryl was used. Again toxic effects of varying degree were noted in 26 and in several instances the patients were loath to use the drug, being somewhat alarmed at their strange symptoms. These cases are summarized in Table V.

The cases manifesting both rhinitis and asthma are summarized in Table VI. It will be noted that in many of these cases rhinitis

TABLE V.

ALLERGIC RHINITIS

A.—SEASONAL

Case	*Age*	*Sex*	*Duration*	*Daily dosage mgm.*	*Side effects*	*Results*	*Remarks*
J.C.	23	F.	5 yrs.	150	Drowsiness, bad taste, palpitation, slight musc. twitching, dry mouth.	Marked relief	Weed pollinosis.
J.W.	46	F.	20 yrs.	50	Drowsiness and diarrhœa	Marked relief	Grass and weed pollinosis.
E.H.	43	M.	7 mos.	150-300	Drowsiness and dry mouth	Marked relief	Tree pollinosis.
W.T.	32	F.	20 yrs	50	Drowsiness and palpitation	Slight relief	Tree pollinosis. Used only at night because of severe drowsiness during day.
L.S.	41	F.		50	Drowsiness and dizziness	Marked relief	Tree-grass-weed pollinosis.
S.R.	28	M.	4 yrs.	50	Drowsiness and dopy	Marked relief	Cause not determined.
H.H.	14	M.	10 yrs.	50	None	Marked relief	Weed pollinosis.
M.W.	64	F.	1½ yrs.	150	Drowsiness, dizziness, palpitation, bad taste	Marked relief	Weed pollinosis.
D.M.	23	M.	10 yrs.	150	Drowsiness, muscle twitching	Marked relief	Weed pollinosis.
H.R.	28	F.	7 yrs.	100	Drowsiness	Slight relief	Cause not determined.
H.O.	13	F.	1 yr.	150	Drowsiness	Slight relief	Fungus and pollen allergy.
W.G.	23	F.	9 yrs.	150	Drowsiness	Marked relief	Weed pollinosis.
R.E.	33	F.	3 yrs.	100	None	Marked relief	Weed pollen and animal sensitivity.
S.S.	38	F.	9-10 yrs.	50	None	Marked relief	Pollen and animal sensitive.
A.L.	29	F.	25 yrs.	50	Drowsiness, muscle twitching, palpitation	Marked relief	Pollen, animal and dust sensitive.
S.C.	29	F.	14 yrs.	100	Drowsiness, dizziness, irritable, chilly, rash	Marked relief	Weed pollinosis.
K.H.	55	F.	10 yrs.	100	Drowsiness, bad taste	Marked relief	Grass and weed pollinosis.
C.W.	68	M.	1 yr.	150	None	Marked relief	Grass pollinosis.
					B.—PERENNIAL		
N.C.	32	F.	15 yrs.	100	Not recorded	Marked relief	Cause not found.
H.K.	35	M.	1 yr.	150	Drowsiness and bad taste	Marked relief	Cause not found.
J.H.	34	F.	2½ yrs.	100	Drowsiness	Marked relief	Pollen, animal dust and cosmetic sensitive.
E.W.	24	M.	10 yrs.	100	None	Marked relief	Cause not found.
V.S.	20	F.	1 yr.	50-150	Drowsiness, dizziness, nausea	Marked relief	House dust sensitive.
H.F.	28	F.	1 yr.	50	Drowsy	Marked relief	Pollen, fungus and dust sensitive.
B.H.	40	F.	1 yr.	150	Drowsiness and cold extremities	Marked relief	House dust sensitive.
K.G.	23	M.	6 yrs.	50-200	Drowsiness	No relief	House dust sensitive.
M.K.	22	F.	20 yrs.	50	Drowsiness	Marked relief	House dust sensitive.
M.M.	30	F.	3 yrs.	50	Drowsiness	Marked relief	House dust sensitive.
H.M.	32	F.	10 yrs.	50-150	None	Marked relief	Cause not found.
G.K.	30	F.	15 yrs.	100	None	Marked relief	Nasal symptoms improved but eyes remained itchy. Cause not found.
G.S.	33	F.	1 yr.	100	Drowsiness	No relief	Cause not found.
L.L.	52	F.	4 yrs.	50	Drowsiness, dizziness, bad taste	Marked relief	Dust sensitive, drug discontinued because of severe side effects.
J.M.	19	F.	8 yrs.	50	None	Marked relief	Pollen, fungus and dust sensitive.
W.M.	42	M.	12-15 yrs.	50-200	Drowsiness	Marked relief	Pollen, dust and glue sensitive.
L.S.	22	F.	5 yrs.	200 prn.	Drowsiness, dizziness	Marked relief	Cause not found.

symptoms were frequently benefited but the asthma did not appear to be helped in any way. Again toxic effects were frequent. In two cases severe asthma developed when the drug was taken and one developed status asthmaticus and required hospitalization.

Table VII records a series of 6 cases of bronchial asthma which had no other allergic manifestations. In none of these was there any benefit from the administration of benadryl and in 2 instances the symptoms became very much intensified. Side effects occurred in three cases.

DISCUSSION

The results in our small series of 80 cases parallel those reported elsewhere. Benadryl produced good, though temporary, relief in a

TABLE VI.
ASTHMA AND ALLERGIC RHINITIS

Case	*Age*	*Sex*	*Duration*	*Daily dosage mgm.*	*Side effects*	*Results*	*Remarks*
A.C.	20	F.	10 yrs.	50-150	None	Marked relief	Atopic dermatitis—food? Asthma only on farm, rhinitis relieved by Benadryl. Etiology?
P.H.	35	M.	10 yrs.	100	Drowsy, nausea	No relief	Could not tolerate drug because of side effects. Etiology?
J.S.	8	F.	5 yrs.	30	None	Moderate relief	Nasal symptoms predominate and relieved. Pollen, fungus dust and orris sensitive.
C.W.	36	M.	11 yrs.	150	None	Marked relief	Nasal irritation and sneezing relieved. Rhinorrhœa and asthma not affected. Pollen sensitive.
E.D.	36	M.	10 yrs.	50	None	Marked relief	House dust and pollen. Asthma not active when treated.
J.S.	28	F.	3 yrs.	150 prn.	Drowsy	Marked relief	Nasal symptoms predominate and completely relieved. Fungus and dust sensitive.
A.M.	56	F.	50 yrs.	150	None	No relief	Nasal symptoms relieved but no effect on asthma. Pollen, fungus and dust.
H.L.	56	F.	2-3 yrs.	150	Urinary complaints	No relief	Pollen and dust and food.
E.A.	54	F.	4 yrs.	150	None	Marked relief	Nasal symptoms improved. Status asthmaticus developed. Etiology uncertain.
E.B.	6	M.	3 yrs.	50	None	Marked relief	Nasal symptoms predominate. Improved few days but relapsed.a Animal and pollen.
W.G.	39	F.	12 yrs.	150	None	No relief	Pollen, animal and dust.
H.W.	26	F.	4 yrs.	150	Dizziness	Marked relief	Nasal symptoms predominate. Pollen and dust.
J.S.	18	M.	3-4 yrs.	150	Drowsiness	Marked relief	Nasal symptoms predominate. Pollen sensitive.
R.T.	9	M.	8 yrs.	50	None	No relief	Administered for nasal symptoms—no relief—asthmatic symptoms developed half hour later. Pollen fungus and dust.
A.P.	38	M.	10 yrs.	200	None	No relief	Dust and food sensitive.
R.M.	18	F.	1 yr.	50	Drowsiness, dopy	Marked relief	Hay fever symptoms predominate. Patient felt side effects worse than allergic symptoms. Pollen and fungus.
J.M.	28	M.	18 yrs.	100-150	Drowsiness	Marked relief	Nasal symptoms relieved but no effect on asthma. Pollen dust and feathers.
O.P.	19	F.	15 yrs.	50	Drowsiness, dizzy	Marked relief	Took 1 capsule only for nasal symptoms which cleared completely and did not recur. Food and dust sensitive.

TABLE VII.
ASTHMA

Case	*Age*	*Sex*	*Duration*	*Daily dosage mgm.*	*Side effects*	*Results*	*Remarks*
O.N.	44	M.	6 yrs.	150	Dry mouth	No relief	Dust and pollen sensitive.
S.W.	33	F.	8 yrs.	150	Vomiting	No relief	Symptoms intensified. Cause not found.
G.N.	60	F.	8 yrs.	200	None	No relief	Cause not found.
E.L.	35	M.	33 yrs.	150	None	No relief	Pollen, fungus, dust and food sensitive.
A.O.	27	F.	2 yrs.	150			Symptoms intensified. Etiology?
F.A.	41	M.	2 yrs.	150	Dizziness and bad taste	No relief	Cause not found.

large proportion of cases of urticaria and allergic rhinitis. The irritation of atopic and contact dermatitis was relieved in many but the skin lesions persisted. The beneficial effects in a few cases of migraine are striking. Asthma was not benefited in any of our cases and in 4 it was seriously intensified following the use of benadryl.

Toxic effects were frequent and of sufficient severity in some to prevent further use of the drug. Many patients complained of unpleasant sensations associated with a clouding of consciousness with the hypnagogic phenomena described earlier in this paper. The chemical structure of benadryl suggests the strong possibility that it may act as an allergen in the same way that drugs of the aniline series do. We have had experience in two instances which led us to believe that we are dealing with a direct benadryl allergen but as we were unable to prove our clinical suspicions we are not reporting these two cases. However, it must be born in mind that allergic reactions to benadryl and other antihistamine drugs of the Fourneau series are likely to occur.

In many instances drowsiness could be effectually overcome by the use of strong coffee or caffeine citrate. We did not observe any notable lessening of toxic symptoms on continued use of the drug, but on reduction of the dosage toxic symptoms were modified and the allergic manifestation remained tolerable.

That benadryl may have important late toxic effects was emphasized by the observation of patient E.W. who had perennial allergic rhinitis of undetermined etiology. He was given benadryl with complete relief lasting for several hours and there were no side effects until several months elapsed when he developed troublesome paræsthesias of his hands and was forced to discontinue use of the drug.

SUMMARY

Benadryl and probably the related antihistamine drugs, as at present known, will be limited in their usefulness. At best they are but symptomatic remedies. Their immediate toxic effects are reasonably well known but more serious effects must be looked for and expected. The nature of the compounds and the diseases they are used to treat mean that in those cases in which good therapeutic results are obtained the drug will be used over rather extended periods. In such cases remote toxic effects on the hæmatopoietic and nervous systems must be carefully considered. Allergy to these drugs is a definite possibility. While many patients are grateful for the temporary relief obtained all prefer to treat their complaints more fundamentally and even urge further allergic study and management.

These drugs have some definite therapeutic value, particularly in urticaria and allergic rhinitis and some troublesome and unpleasant side effects. Perhaps their greatest value will be in providing new methods of experimental study of the fundamental nature of anaphylaxis and clinical allergy.

The bibliography on histamine and antihistamine drugs is very large and the attached references are given to indicate certain key papers and as a guide to others.

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RÉSUMÉ

Le bénadryl et les produits antihistaminiques voisins n'auront jamais, semble-t-il, que des indications limitées. Ils ne sont encore que des adjuvants qui ne soulagent que le symptôme. On connait déjà leurs effets toxiques, mais de nouveaux, encore non connus peuvent apparaître. Les bons résultats obtenus signifient la plupart du temps un usage prolongé de ces produits, et dans ces cas, il faut redouter les effets toxiques sur les organes hématopoiétiques et sur le système nerveux. On peut également devenir allergique à ces médicaments. Mieux vaut encore, semble-t-il, chercher le soulagement définitif dans de nouvelles recherches sur l'allergie. Les références bibliographiques donnent les principales sources de documentation sur la question.

JEAN SAUCIER

Things cannot always go your way. Learn to accept in silence the minor aggravations, cultivate the gift of taciturnity and consume your own smoke with an extra draught of hard work, so that those about you may not be annoyed with the dust and soot of your complaints.—Sir William Osler.

CÆSAREAN SECTION*

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IN recent years, due largely to improvements in technique the safety of Cæsarean section has markedly increased. This has resulted in a widening of its indications, so that today there are few obstetrical complications which may not, on occasion, be best dealt with by abdominal section. Cephalopelvic disproportion, while still an important reason for its performance, does not exceed by such a wide margin the other indications in any series of cases. But while this might suggest a greatly increased incidence of the operation, actually this need not be so. With the more frequent employment of trial labour as a means of dealing with cases of apparent disproportion, many patients who formerly might have been delivered by elective Cæsarean section are today being allowed to deliver themselves vaginally. On the other hand, having confidence in the outcome for the mother, we can give more consideration than was formerly possible to the fetus. So we find Cæsarean section being done, and justifiably, for some cases of prolapsed cord, for types of placenta prævia other than central, and for certain cases of malpresentation. Cæsarean section is now a safer method of delivery for mother as well as for her child, than a difficult forceps extraction.

As a basis for the remarks in this communication I wish to use a series of Cæsarean sections performed during the six years 1940 to 1945 by myself, or by a resident doing the operation with my assistance. The cases are 158 in number. Of these, more than half were performed in the Maternity Hospital of which I had the complete charge; the remainder were done in three other hospitals to which I acted as consultant. This is a very modest series and too small to warrant any detailed statistical analysis. I wish to use it therefore merely as a starting point for some reflections on the place of Cæsarean section in modern obstetrical practice.

At the outset, let us consider what should be the incidence of Cæsarean section in any well run maternity hospital. According to Stander, it should not exceed 4% and in private practice it should be much lower. There are not a few institutions where this figure is greatly exceeded and rates as high as 8 or 10% are reported from some hospitals in the United States and in Great Britain. One cannot but believe that such figures as these indicate a distorted view of the place of Cæsarean section in midwifery. When one considers that one woman in ten or twelve is delivered by an abdominal operation, one is forced to conclude that a valuable procedure and obstetricians themselves are being brought into disrepute. It needs to be emphasized and re-emphasized, that delivery by Cæsarean section is still a more dangerous method for the mother than delivery *per vias naturales* for one still encounters doctors, not to speak of patients and their relatives, who consider it the simplest way out of any difficulty that may develop in midwifery. Reports from various centres show maternal mortality rates as high as 5%. According to Aleck Bourne the mortality risk of Cæsarean section even in selected cases, is four times that of labour. In a study of cases performed at the Winnipeg General Hospital made by Ross Mitchell in 1938, the death rate from Cæsarean section was 6 times that of the general rate. In a recent detailed study of Cæsarean section mortality made by Dieckmann of Chicago it is claimed that in favourable circumstances and when the operation is done by skilled operators the maximum total mortality rate should be 0.5 to 1%, still appreciably higher than the rate for vaginal deliveries.

There is not only the question of mortality to be taken into account. There is a good deal of evidence to suggest that the performance of a Cæsarean section reduces a patient's fertility. Even apart from this, once a section has been performed, there is a strong likelihood that the next pregnancy will have to be terminated by the same method, when, in very many cases sterilization will be carried out as well. Moreover there are few obstetricians who will permit their patients to undergo more than three sections. It follows, then, that if a woman has a section for her first pregnancy, the size of her family is likely to be seriously restricted.

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In six years in which I was in charge of the Maternity Hospital of the Preston Royal Infirmary there were 113 sections in 5,133 cases, or an incidence of 2% and in the last year of the series there were only 17 sections in 947 cases, that is, a frequency of only 1.8%. This figure includes all cases, booked and emergency.

In the 158 cases there were three maternal deaths, a relatively high rate of 1.9%.

The first of these occurred in a woman of 26, admitted to hospital at the 24th week in her first pregnancy because of congestive heart failure, the result of a rheumatic infection. She made a reasonably good recovery with rest in bed and digitalis, but was kept in hospital continuously until the onset of labour. About the 34th week her cardiac condition began to deteriorate and at the 35th week she started in labour. Although the baby was small, it was considered advisable to spare the mother the exertion attending a vaginal delivery, so a lower segment Cæsarean section was performed under local anæsthesia and a living child, weighing 2 pounds 15 ounces was delivered. The mother's condition was not satisfactory throughout the operation and shortly after its conclusion left ventricular failure became evident and death occurred three hours later.

The second maternal death was in the case of a woman who had already had one classical Cæsarean section because of disproportion. At the second operation, done under ether anæsthesia prior to the onset of labour, the abdomen contained very many adhesions, making exposure of the lower segment very difficult, therefore a classical incision was made and a living mature child was delivered. The mother made an apparently satisfactory recovery and was afebrile. On the eighth day, while sitting in bed nursing her baby, she suddenly collapsed and died within a few minutes. Autopsy confirmed the obvious clinical diagnosis of a large pulmonary embolus.

The third fatal case of the series was the only one to occur in my own hospital. The patient was a booked case, a primigravida admitted at the 34th week. She had last attended the ante-natal clinic about 10 days previously, when nothing unusual had been noted. At 7 a.m. on the day of admission she was found lying unconscious on the floor of her home and was sent in to hospital as a case of eclampsia. On admission she was stuporous, there was a moderate cloud of albumin in the urine, the blood pressure was 150/90, no œdema was present and the fetus was alive. She was given a quarter grain of morphine, but as the case presented some rather unusual features the usual routine treatment of eclampsia was withheld pending further observation. Three hours later it was noticed that the pulse rate had fallen to 52 and the patient roused herself sufficiently to complain of pain at the back of the neck. The true diagnosis was now apparent; a lumbar puncture revealed almost pure blood in the subarachnoid space. As the day went on her condition deteriorated further and in the evening convulsive seizures supervened, Cheyne-Stokes respirations developed and it was obvious that a fatal outcome was to be expected. With the patient in a moribund condition, a classical Cæsarean section was done under local anæsthesia and a living male child, weighing 3 pounds 12 ounces was delivered. The mother expired 4 hours later; autopsy revealed a ruptured congenital aneurysm of the middle cerebral artery. The child was successfully reared.

I believe that in such circumstances as these a Cæsarean section done on a dying patient is to be preferred to the post-mortem Cæsarean section usually advocated; certainly the prospect for the child is better if the former is chosen.

In the series presented, 19 of the sections were of the classical type, the remainder, or 88%, were done through the lower uterine segment. The latter operation was used routinely for elective cases as well as for those in labour. The classical incision was reserved for patients in whom the lower segment was inaccessible because of markedly pendulous abdomen, the capacity of the belly being extremely reduced as a result of spinal deformity, or because of extensive adhesions. To argue here the advantages of the lower segment Cæsarean section should be superfluous. To all modern obstetricians the classical operation is practically obsolete. Yet in spite of the years of preaching the superiority of the lower segment operation, notably by DeLee in America and Marshall in England, there are still too many classical operations being perperformed. It has been demonstrated repeatedly that the maternal mortality for classic section is 3 to 4 times that of the lower segment operation in the hands of the same operators. In the series I present there was no death from puerperal sepsis, even though in many instances the membranes had been ruptured for as long as 48 hours and even up to 84 hours.

I cannot imagine any valid reason for failing to employ the low segment operation as a routine. Technically it is only slightly more difficult than the classical section. It involves working in a somewhat less accessible field, and requires the elevation of a peritoneal flap before incising the uterine musculature. It therefore takes a little longer time, but is a neater procedure, involves less blood loss and is more satisfying to the surgeon, apart altogether from its advantage to the patient, than the old "smash and grab" classical operation. I have taught many hospital residents (within a reasonably short time) to do the operation proficiently.

However, it must be admitted that one does encounter trouble more often in the lower segment section. In some cases where the fetal head is deep in the pelvis, it is no easy matter to dislodge it upwards and through the uterine incision, and it may take all the strength of one's hand and forearm to accomplish. In such cases as these, and also where the fetal head is large, the uterine incision may extend to a serious degree, making subsequent suture very awkward. In the same circumstances one may tear into the greatly dilated veins of the broad ligament, with resultant furious hæmorrhage.

A very interesting error one can make is, in a case where labour is well advanced and the cervix is almost fully dilated, to mistake the posterior lip of the cervix for the lower margin of the uterine incision. This may sound absurd and appear to justify censure for gross carelessness, but it is easy to do. It is a recognized danger and is described in Marshall's monograph on lower segment Cæsarean section.

Placenta prævia is often conceded as an indication for doing a classical section, even by those who admit the superiority of the more modern operation. With this I cannot agree. If the lower segment method is safer for cases, say, of disproportion, it is more so for placenta prævia cases, since these patients have usually had one, and often more than one vaginal examination before they reach the theatre table and the risk of infection is correspondingly increased. What is the objection to the lower segment operation in placenta prævia? Simply that if the placenta is located on the anterior wall one will encounter severe hæmorrhage in cutting through it. But surely the same situation, *i.e.*, the placenta underlying the uterine incision, is just as likely to be met with in classical sections when the placenta is normally situated in the upper segment. While it may be a little more troublesome, it does not greatly increase the difficulty of the operation. Moreover, the lower segment operation has the advantage in those instances of placenta prævia where there is profuse bleeding from the placental site after the placenta has been delivered, since the bleeding point can be accurately distinguished and the hæmorrhage checked by appropriately placed sutures.

The most important advantage of using the lower segment operation is that it permits one to intervene with safety after the patient has been in labour. This means that in cases where, before labour, one is in doubt as to a successful outcome for vaginal delivery, one can give the patient a trial of labour. Since the great majority of such women do deliver themselves vaginally or can be delivered by a relatively easy forceps operation, the result is that one does fewer sections, and many patients are spared abdominal delivery. The obstetrician who does only elective sections (and if he does not practice the lower segment operation all his sections must perforce be elective, the risk of sepsis following classical sections during labour being prohibitive) may declare that his judgment is so accurate that he can select without error, prior to labour, those cases that will deliver vaginally and those who will not. I wish to state firmly, no matter who he is that makes such an extravagant claim, that he *cannot* be sure. He will always have a significant percentage of errors. In cases of moderate disproportion it is impossible to distinguish those that will require section and the others that will not. I never cease to be amazed at the degree of disproportion that can be overcome, granted a co-operative patient and strong uterine contractions. In so many of the most unlikely cases will an uncomplicated vaginal delivery ensue. Of the cases here reported 67 were elective and operated upon before the onset of labour, while in 65 labour had been in progress a variable length of time when the section was performed. In the remaining 26 cases the patient was not in labour but there had been ante-partum hæmorrhage.

ANÆSTHESIA

Ether anæsthesia was used more often than any other anæsthetic agent, in 68 cases, induction being by ethyl chloride or chloroform. Ether is far from being the best anæsthetic but it is often the only one available, when one has to depend on house surgeons or general practitioners to administer the anæsthetic. The particular objection to ether in Cæsarean section is that it makes for poor retraction of the uterine muscle following delivery, so that there is often very free bleeding; one has to introduce one's hand into the upper part of the peritoneal cavity to grasp the uterus to express the placenta and to apply massage or compression, an undesirable procedure when there is a possibility that the case is infected. In many ways a general ether anæsthetic throws an additional burden on a patient who needs all the energy she can summon for her recovery.

My experience with spinal anæsthesia has been limited; in only five of my cases was it used. Like many obstetricians I have been wary of it because of its condemnation in obstetrics by DeLee, who believed that pregnant women were peculiarly sensitive to spinal anæsthesia and that to it alone could be attributed 1% of maternal deaths from Cæsarean section. But it has been pointed out before now that it is as important to distinguish among the different drugs used for spinal anæsthesia as it is among those used for

inhalation anæsthesia. One would hardly condemn all forms of general anæsthesia because there have been deaths from chloroform. There is good uterine retraction and very little postpartum hæmorrhage with spinal anæsthesia and these advantages make it a valuable method.

A large percentage of my cases were done under infiltration anæsthesia. The actual number was 64, or 40%. The drug used was novocaine 0.5% and between 250 and 300 c.c. was the amount usually required. In many respects this is the ideal mode of anæsthesia for Cæsarean section. Certainly no death due to its use has ever been reported. The uterine retraction which occurs is most striking, there is very little blood loss, often as little as 2 to 4 ounces, and the placenta separates without delay so that it can be withdrawn by steady traction on the umbilical cord. It is thus the method of choice if the patient has already suffered from blood loss. There is never any difficulty in resuscitating the fetus, which usually cries as soon as the head is delivered. The postoperative course is undisturbed by any complications due to the anæsthetic, there is usually no vomiting and therefore no strain put on the sutures. With its use one is assured that no additional handicap has been imposed on the patient's recovery. It is the method of choice in cardiac disease, in cases where the patient comes to operation tired out due to neglect in a long drawn-out labour, in diabetes and in eclampsia. A diabetic patient can have her usual breakfast, go up to the theatre an hour or two later, be delivered under infiltration anæsthesia, then be returned to the ward to have her usual dose of insulin followed by lunch, with no untoward disturbance. In eclampsia, I am sure that a good part of the extremely high mortality associated with Cæsarean section for that condition can be ascribed to the use of general anæsthesia. It is important to realize, of course, that in very few cases of eclampsia is a Cæsarean section indicated, and I intend to discuss these indications later, but if an operation has to be done, local anæsthesia is the only method to be considered.

Local is not a suitable form of anæsthesia for all patients. One would not select it where any additional intra-abdominal procedure is contemplated, such as removal of fibroids or ovarian cysts. It is possible to ligate the tubes under local anæsthesia after first infiltrating between the layers of the mesosalpinx, or alternatively the patient can be given pentothal a minute or two before the sterilization is commenced. In the case of a very nervous, apprehensive patient one would naturally consider some other form of anæsthesia, although it is surprising how well behaved most women are when they are told beforehand the advantages for themselves and their baby from having a local anæsthetic. Just before the operation is commenced one can administer morphine gr. 1/6 or omnopon gr. 1/3. I have had good success with demerol 100 mgm. combined with scopolamine gr. 1/150 given 45 minutes preoperatively, and another 100 mgm. demerol with scopolamine gr. 1/450 administered as the operation is commenced. Some patients will remain asleep almost throughout the operation and have no recollection of it afterwards under this sedation.

The operation takes a rather longer time (usually an hour or slightly less, I find) under local anæsthesia than when other methods are employed and of course one must exercise the utmost gentleness. It entails greater strain on the operator but this is well worthwhile.

More recently I have had the opportunity of doing a group of sections, 18 in number, under cyclopropane anæsthesia. It has no depressing effect on the patient, there is excellent uterine retraction and not a great deal of blood loss. The high percentage of oxygen given with the gas means that the fetus is generally in good condition. Despite this theoretical consideration there are occasions when the fetus seems adversely affected and I had one case where the fetus was stillborn after an elective operation when there had been no undue difficulty in delivery. It appears that pituitrin shock is greatly accentuated when it occurs under cyclopropane anæsthesia and may cause a fatality. Therefore one should use only pitocin or preferably ergometrine, as an oxytoxic agent when using this form of anæsthesia.

INDICATIONS

When we come to consider the indications for Cæsarean section in this group of cases, we find, as is to be expected, that more were done for disproportion than for any other single cause. The total number in which this was the indication was 60. Of these, 34 were performed after a trial labour and 26 were done as

elective operations. In this latter group 11 had already had a previous section for disproportion and 2 had a malpresentation as well as pelvic contraction, so that in only 13 cases was the operation done before the onset of labour because of gross disproportion alone. Two of these were done on the same patient, an achondroplasic dwarf with a diagonal conjugate of 2¼ inches. Another patient was 3 ft. 8 in. in height due to Pott's disease of the spine. A third had gross lumbar kyphosis and scoliosis with a pendulous belly. There was one, a primigravida of 41, with a markedly contracted outlet. I mention these to make it quite clear that our general policy was to give all save very few patients a chance to demonstrate whether or not they could deliver themselves vaginally. There are circumstances when it is not possible to conduct a trial of labour. A trial of labour means that a patient must be under close and accurate supervision by the obstetrician, in the constant care of midwives experienced in the management of such cases. If the patient is in a hospital ten miles away from the centre where one is directing a busy obstetric practice, one cannot see her as often as a proper test of labour demands, and one will be forced to do an elective operation on a woman who might otherwise have been given an opportunity to deliver herself with a fair prospect of success.

In 21 cases of the 158 the operation was performed for the sole reason that the patient had already had one, and in 2 instances, two Cæsarean sections. This raises the question as to whether a patient should be allowed to have a vaginal delivery when she previously has had an abdominal section. In the opinion of many obstetricians of repute, the reply to this query is "No, she should not". The objection to vaginal delivery subsequent to section is, obviously, that the risk of rupture of the uterine scar greatly exceeds the risk of a section done before term in favourable surroundings. But this doctrine carries with it the corollary that the size of the family must be restricted to only one, or at the most, two more children in addition to the first one born by Cæsarean section, since the same obstetricians advise that sterilization be carried out after the second section and insist on it after the third. This is a condition refused by many mothers.

I can only answer from my own experience. I can report a series of 34 vaginal deliveries conducted under my charge in 33 patients who had had a prior section; one patient had two children vaginally after her first operation. In seven of these the section had been through the lower segment of the uterus, in the remainder it had been of the classical type. The danger of rupture is estimated to be ten times as great (4%) in cases coming within the latter category. In twelve cases the operation had been done for cephalopelvic disproportion. In some instances the subsequent child had a smaller birth weight, but in not a few it was heavier than the first infant. The indication for the first section in the remaining patients was; malpresentation (breech) 5 cases; placenta prævia, 5 cases; toxæmia, 2 cases; pelvic tumour, 1 case; and in 6 cases the reason for the operation was not known. Three patients were delivered vaginally after 2 previous sections, in one case done for disproportion, in one for an unknown reason, and in the third because of tonic contraction.

This last case was the only one in which rupture of the uterus occurred. I performed her first Cæsarean section when she was admitted with tonic uterine contraction, with a retraction ring and imminent uterine rupture. When she returned pregnant a second time the fetus was a very large one (10 pounds) and a second section was done. At the close of the third pregnancy it was considered that the fetus would pass through the pelvis without difficulty, and as it proved, it did so. Labour was uneventful but the fetus was stillborn and shortly afterwards signs of intra-abdominal hæmorrhage became apparent. Laparotomy revealed a rupture through the old uterine scar. The error in judgment here was to allow a uterus whose lower segment had been so extremely overstretched on a former occasion to go into labour; one could not expect a strong scar from suture of such a thinned-out uterine wall.

My opinion is that if all other circumstances are favourable, it is reasonably safe to allow a patient who has had a previous lower segment operation to go into labour on a subsequent occasion if the postoperative course had been comparatively afebrile. A history of uterine infection would imply a weakened scar. In the case of a former classical section, as well as selecting for vaginal delivery only those whose recovery had been uneventful, I would endeavour, by soft tissue radiography, to determine the position of the placenta. If this is found on the anterior wall I would certainly do a repeat section just before term, since the implantation of the placenta over the old scar renders it liable to rupture. Moreover, the placenta can be adherent to the scar and the

patient's life may be endangered by post partum hæmorrhage, while in removing the placenta manually in such circumstances there is a grave risk of passing one's hand through the uterine wall in its thinned-out portion.

Heart disease was the indication for Cæsarean section in four patients, one of whom had a subsequent repeat operation and sterilization. In all of these the cardiac condition was rheumatic in origin, and there was considerable reduction in the heart's reserve. The more one sees of patients with heart disease associated with pregnancy, the less one is inclined to resort to an operative method of delivery. I have seen a patient who had to walk very slowly the few yards from the hospital entrance to the consulting room couch, because of extreme shortness of breath, deliver herself normally of a seven pound child, with no untoward symptoms whatever, after a short labour. Almost every midwife can remark glibly and cheerfully that "heart patients have easy labours" and, to a point, this is true. Nevertheless there are some cases (in their selection one will naturally be guided by the physician), who are not fit to bear the strain of labour and are best dealt with by section. Local anæsthesia is excellent for these mothers.

Section was chosen as the mode of delivery in three cases in whom extreme rigidity of the cervix developed with consequent prolongation of labour. Almost always this condition can be satisfactorily dealt with by general supportive treatment including the judicious use of sedatives. In one instance operation was made necessary by fetal distress, in another by extreme distress of the mother, even though the fetus was known to be dead, while in the third case the patient had already had a Cæsarean section and a rupture of the scar was feared.

In seven cases section was performed because of the presence of pelvic tumour. This was a uterine fibroid in four instances. Such tumours in the great majority of cases have little, if any, effect on the course of labour and only rarely cause obstruction. It is only when the fibroid is situated very low on the posterior uterine wall, so as actually to underlie the fetal head, that interference through the abdomen is called for. If a fibroid so placed is very large it can also cause a malpresentation which is an additional indication for operation. If a pedunculated fibroid is found which can easily be removed at the time of the section, it is wise to do so, but large intramural fibroids, it is generally conceded, are best left alone. There were three cases of ovarian cyst occupying the pelvis preventing descent of the fetus. Such tumours should be removed when first discovered early in pregnancy, but if they are not found until the gestation is far advanced there is some disagreement among obstetricians as to their management. My own opinion is that the patient should be permitted to go practically to term and that then a Cæsarean section should be performed as well as removal of the tumour. The entire situation can thus be dealt with at the one operation. Others claim that one should remove the ovarian tumour no matter how late in pregnancy it is first discovered. Then the patient is allowed to go into labour spontaneously and deliver herself or be delivered with forceps early in the second stage. By this means, it is true, the woman is spared a scar in her uterine wall, but it is a heroic form of treatment. The only type of case I would manage in this way is one which has been neglected, and is potentially infected on admission.

Cæsarean section was done for toxæmia of pregnancy on only 3 occasions, and in only 2 cases of eclampsia. These are conditions which are best managed more conservatively, usually by induction of labour. Many American obstetricians perform section on a considerable number of patients with pre-eclamptic toxæmia, especially if prodromata of convulsions are present. But patients should not be permitted to progress to such a stage without induction, and even so late as that it is possible to avert the seizures with sedatives. I resort to section only in the case of elderly patients of low fertility or if some other complication is present. The high mortality of section for eclampsia is now everywhere acknowledged but I believe there are rare cases where it is justified. These are patients in whom the fits have been adequately controlled by sedation for twenty-four hours or so, yet there is persistent deep coma with no indication of the onset of labour. I have seen such cases as this die, even though vaginal delivery may have eventually taken place. In two cases of this description I have done Cæsarean section under

local anæsthesia, with survival of the mother in both instances. One fetus was stillborn.

Accidental hæmorrhage is another condition which can almost always be safely dealt with by measures which result in vaginal delivery, and so in only 2 cases of this series was Cæsarean section selected as the mode of delivery; in one because the fetus was still alive despite the classical picture of combined concealed and revealed hæmorrhage. Vaginal delivery would have resulted in a stillbirth, whereas actually the baby survived. In the other case the cervix was long and narrow, external bleeding was continuous and profuse, and the patient was badly shocked. She survived a classical section done under local anæsthesia.

In 26 cases placenta prævia was the indication for Cæsarean section. In 16 of these the placenta covered completely the internal os and this type of case does not need further discussion. No other method of delivery ought to be considered. In regard to the marginal variety, the more experience I have of these, the oftener am I inclined to select section as the method of delivery. There was a time when I prided myself that if I could feel even the smallest area of membrane at the os, I could terminate the case vaginally with success as far as the mother was concerned but I found I had too many stillbirths. One can never be sure of the outcome. The case may be one of marginal placenta prævia in a multipara, in active labour with the cervix dilating well, when the only treatment used is rupture of the membranes and the baby is born only a few hours later, yet may be stillborn. If the bleeding is profuse, if the cervix is undilated, if the patient is not in labour, if the baby is particularly badly wanted, I therefore have no hesitation in doing a section for this type of case. In 2 instances section was performed for lateral placenta prævia, but in each there was an additional complicating feature; in one, a cord presentation, in the other a transverse lie.

Uterine inertia, though such a trying condition, both for mother and obstetrician, is usually best managed by patience and careful attention to details in the conduct of the first stage of labour, but where other factors have as well to be considered section may be a wise procedure. In 10 of my patients inertia was the indication for operation. In 2 of these there was a degree of disproportion present which could have been overcome by the development of strong contractions but which, in their absence, sufficed to prevent the passage of the head through the brim. In another instance the patient had already had one Cæsarean section. But in most of this group operation was resorted to because the patient was advanced in years (the ages ranging from 39 to 44) and was of low fertility (married from 6 to 18 years with no previous pregnancies).

Akin to this type of patient are those, 5 in number, on whom Cæsarean section was done solely because of an unfortunate obstetric history of repeated stillbirths or stillbirth with advanced years. In such cases one should not take any avoidable risk with the fetus.

Malpresentation of the fetus constituted the indication for section in 19 cases, but in many of these there was some additional complication which lent weight to the decision to adopt operative delivery, for example, a bad obstetric history, contracted pelvis, previous Cæsarean section or low fertility, and, in the case of oblique lie, placenta prævia or pelvic tumour. There were 7 cases of breech presentation, 7 of oblique lie, 2 of brow, 2 of face, and 1 of posterior parietal presentation.

There remains a group of miscellaneous conditions for which Cæsarean section was done in only one or two instances in the present series. These comprise such conditions as: diabetes (2 cases); tonic uterine contraction, previous rupture of the symphysis pubis, dystrophia dystocia, moribund patient, cord presentation and cord prolapse. The latter may appear somewhat radical, but there is a growing opinion among obstetricians that Cæsarean section is justifiable in some cases. The management of prolapsed cord is almost invariably attended by a high fetal mortality, especially in those cases in which the cervix is only beginning to dilate. If other conditions are favourable and if the delay in the patient reaching the theatre table is very short, one can prevent a number of stillbirths by performing section.

This discussion makes no claim to be a complete statement of the factors involved in the selection of Cæsarean section as a mode of delivery. Obviously a topic of such major importance cannot be adequately covered in a single article. I submit the above remarks simply as an outline of the cases within my

personal experience together with some of the conclusions for which they have formed the basis.

RÉSUMÉ

Réflexions basées sur l'expérience de 158 cas de césariennes en 6 ans. Pas plus de 4% des parturientes devraient avoir des césariennes. La mortalité maternelle varie de 1 à 5%. Cette opération limite les naissances subséquentes à 2 ou 3 enfants. Le procédé de choix est la section du segment inférieur de l'utérus, même au cas d'un placenta prævia, et le mode d'anesthésie le plus sûr semble être l'infiltration novocainique. L'anesthésie générale sera joutée s'il y a lieu de faire d'autres opérations concomitantes. Les principales indications de la césarienne sont la disproportion cranio-pelvienne, une césarienne antérieure, une mauvaise présentation, certains placenta prævia, les toxémies, les tumeurs pelviennes et certains cas d'inertie utérine. Toutes ces indications générales sont affaire d'interprétation et de circonstances particulières. JEAN SAUCIER

SARCOIDOSIS*

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THE modern concept of sarcoidosis is that it is a systemic disease in which many tissues, or any tissue, may be involved. Commonly affected sites are the skin, lymph nodes and lungs, but the lesion has been found in the bones of the hands and feet, in the mucosa of the mouth, nose and throat, in the tonsils, in the breast, in the wall of the gastro-intestinal tract, in the salivary glands, eyes, liver, spleen, kidneys, testicle, skeletal muscles, pituitary gland, central nervous system and heart.

The condition has been variously referred to in the literature as Boeck's sarcoid, Besnier-Boeck's disease, Schaumann's disease and benign lymphogranulomatosis.

ETIOLOGY

The etiology of the disease is obscure, and its nature is disputed. David Reisner[1] in an exhaustive review of 35 cases stresses the not infrequent occurrence of frank pulmonary tuberculosis as a late stage in sarcoid of the lung, and on this and other evidence, bases his suggestion that the disease is of tuberculous origin. Boeck[2] found a few acid-fast bacilli in a nodule from the nasal mucosa of one of his patients and inoculation of this material into a guinea pig produced a very chronic form of tuberculosis. He concludes, therefore, that sarcoidosis is an atypical form of tuberculosis. Schaumann[3] is of the same opinion, believing that the etiological agent is probably a benign form of the bovine bacillus. Tice and Sweany[4] state that many cases which have been followed for years have shown a gradual change from the "sarcoid state" to some form of tuberculosis showing both caseation and tubercle bacilli, and several writers refer to the disease as non-caseating tuberculosis. However, the results obtained by the majority of workers coincide with those of Harrell[5] who, in a study of eleven cases, failed to demonstrate tubercle bacilli by microscopical examination, cultural methods, or by inoculation of guinea pigs, rabbits, mice, rats, and fowl. He suggests that sarcoidosis may represent a reaction to the lipoid fraction of a variety of organisms. Many continue to believe, however, that it is a specific disease due to an unknown agent.

PATHOLOGY

Pathologically, sarcoidosis is characterized by the appearance in the affected tissues of cell aggregations which resemble miliary tubercles, but which differ from these in that the giant cells tend to be very large and vacuolated, the peripheral zone of lymphocytes being absent or poorly developed. The nodule is very sharply delimited and, it is very important to note, caseous necrosis does not occur and tubercle bacilli cannot be found. With aging of the lesion the giant cells disappear and the nodules are eventually replaced by fibrous tissue.

Because of the presence of tissue changes of this type many clinically diverse conditions are now described as sarcoidosis. These are multiple benign sarcoids, lupus pernio, benign lymphogranulomatosis, uveoparotitis, regional ileitis, atypical miliary tuberculosis and atypical tuberculous splenomegaly.

CLINICAL FEATURES

Sarcoidosis occurs chiefly in young adults. It runs an extremely chronic, relatively apyrexial course, usually uninfluenced by any treatment, although spontaneous regression frequently occurs and many cases have been known to progress to apparent cure. Constitutional symptoms are rarely severe, but weakness, loss of weight, joint and muscle pains, cough, shortness of breath, and pain in the chest have been noted. The eye may be involved, leading to partial or even, in rare cases, complete blindness. Con-

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junctivitis may occur with keratitis, iridocyclitis or more extensive involvement of the uveal tract. Parotitis may be associated with salivary and lachrymal changes to produce Mickulicz's syndrome. Considerable deformity of fingers and toes may be found in those patients whose bones are affected. Extensive infiltrations of the lungs may be of serious import and may eventually lead to death from cardiac failure. Cardiac symptoms may also be due to direct involvement of the myocardium (Salvesen[6]).

Laboratory Findings

A finding which appears to be fairly constant in the active stage of the disease is an increase in the globulin content of the blood, leading to hyperprotinæmia and a reversal in the albumin-globulin ratio. In 10 of Harrell's 11 cases the serum globulin varies between 3.9 and 6.0 gm. per 100 c.c. (normal 1.2 to 2.8 gm.). Similar findings have been recorded by other writers. Harrell also reports an increase in blood phosphatase in all seven cases in which this estimation was done and some degree of bilirubin retention in the four cases in which this was studied.

The blood usually shows an increase in the sedimentation rate. Both monocytosis and eosinophilia have been found and there is a tendency towards neutropenia. In Reisner's series monocytosis was present in 50%, eosinophilia in 25%, and leucopenia in 33%. The sedimentation rate was increased in most cases.

Radiology.—Radiologically the picture is that of bronchial glandular enlargement occurring alone or in association with lung infiltration of two general types. The hilar glands are usually found enlarged to some degree, the enlargement resulting in heavy lobulated lung roots.

The first type of parenchymal involvement is characterized by numerous small rounded shadows of about match-head size, more sparsely distributed than is the case in miliary tuberculosis and of slightly greater size and density. They may be as numerous at the periphery as elsewhere and are not related to the larger divisions of the bronchial tree in distribution. These densities usually remain discrete but may be rendered ill defined when, by pressure on bronchial structures, small atelectatic areas are produced. These nodules may occur in any portion of the lung or may be uniformly distributed throughout both lungs. They presumably represent the development of sarcoid tissue in the lymphoid deposits of the lung parenchyma. These lymphoid deposits have been shown to be of uneven distribution and irregular size.

The second form of parenchymal lung involvement results in the production of a coarse network or reticulum of linear shadows, unbranched, dense, present in undiminished size in the periphery, unrelated to the course of pulmonary vessels and converging to the hilum. Associated with these shadows may be seen a very faintly stippled appearance similar to that which occurs in congestive heart failure. Kerley[7] believes that the stippling and linear shadow formation are due to congested or blocked lymphatics which when viewed longitudinally present the appearance of striæ and which, when seen end on, form a nodular pattern.

There is, strictly speaking, no characteristic or diagnostic change in sarcoidosis. Reisner states that in three of his 35 cases the radiological appearance was in no way different in type or distribution from that of pulmonary tuberculosis of productive and fibrotic type. In two of his cases the appearance was that of densities resembling pneumonic consolidations. According to Snapper[6] a diagnosis of sarcoidosis should be entertained when the x-ray picture of miliary tuberculosis is found in the lungs of a patient who is apyrexial and whose general health is not impaired.

Diagnosis

The diagnosis, in the absence of proof by biopsy, must rest on the clinical picture as a whole. When the classical picture of sarcoid skin lesions with bone changes and involvement of viscera, or visceral lesions with eye and parotid involvement is found, the diagnosis may be made in some cases with fair confidence. In other cases where visceral involvement only is found, or glandular change is observed, diagnosis on purely clinical grounds may be impossible.

Sarcoidosis must be differentiated most commonly from tuberculosis of the lung, glandular tuberculosis, hæmatogenous tuberculosis, Banti's disease, Hodgkin's disease, and other diseases of the lymphoblastoma group.

Differentiation from parenchymal tuberculosis may be difficult or impossible. In the four cases presented in this paper two had, at one time or another, been considered to have pulmonary

tuberculosis. The most important distinguishing points are: the failure to find tubercle bacilli, the tuberculin anergy which occurs in 40 to 50% of all patients suffering from sarcoidosis, the extremely chronic course with periods of remission from symptoms, certain blood changes, notably the reversal in the albumin-globulin ratio, and moderate eosinophilia. Finally, the radiological findings as earlier described may differ in important respects from those of tuberculosis.

The author has not seen any case in which splenomegaly has been demonstrable. According to Reisner these cases in which splenomegaly is the dominant clinical feature may be confused with Banti's disease. The co-existence of lesions in other organs not characteristically involved in Banti's disease may assist in differentiation. As in other cases, however, biopsy may be necessary to establish the true diagnosis.

In one of our cases, the original diagnosis nine years ago was Hodgkin's disease. On clinical and roentgenographic evidence alone differentiation may be extremely difficult. As a rule in Hodgkin's disease and other diseases of the lymphoblastoma group constitutional disturbance is more severe and the downward progress of the untreated patient uninterrupted, whereas in sarcoid, remissions are common. It must be remembered, however, that sarcoidosis may on occasion produce severe constitutional disturbance and, that, on the other hand, extremely chronic cases of Hodgkin's disease have been observed. Generalized glandular enlargement may occur in both diseases but much more frequently and usually to a much more pronounced degree in Hodgkin's. Mediastinal gland enlargement, as observed radiologically, is common to both conditions. Generally speaking however there are certain differences in character and distribution of glandular enlargement. In Hodgkin's disease the paratracheal glands are usually first involved, especially the right, with subsequent involvement of the tracheo-bronchial glands at the bifurcation with later involvement of the bronchial group. In sarcoidosis the bronchial group is usually predominantly and symmetrically involved. Finally a test dose of irradiation will radically affect the glandular enlargement of the leukæmias, of lymphosarcoma and of Hodgkin's disease but will have little or no effect on the enlarged glands of sarcoidosis.

PROGNOSIS

In considering prognosis Reisner states that "there are no means of determining the course of the disease in the individual case except by actual observation of its evolution". Approximately one-third of his cases showed a clearly regressive course with apparent recovery, in one-third the disease was either stationary or periods of remission alternated with exacerbations and in the remaining third the course was entirely progressive. Seven patients of this series died while under observation.

Snapper considers that the prognosis, on the whole, is favourable. In his series of 13 cases one patient only died as a result of right heart failure produced by fibrotic change in a lung affected by sarcoidosis. Three of his patients were under observation for 8, 18 and 20 years respectively. The ultimate prognosis must depend on the localization of the disease and the degree to which function in the affected organ is permanently impaired. Thus sarcoidosis may directly invade the heart muscle, as in Cotter's case, resulting in early death, or the central nervous system, as in three cases recently reported by Linnell[9] at the Toronto General Hospital, resulting in an inevitably fatal termination; or it may confine itself to superficial lymph glands, or tonsil and cervical gland as in the second case reported here, or some similarly innocuous situation, and little influence the patient's expectation of life.

TREATMENT

No specific therapy has been discovered for the treatment of sarcoidosis, although arsenic has appeared to benefit some patients. Recently Ost,[10] after a failure with chrysotherapy (crisalbine), and mapharsen combined with x-ray, observed complete recession of a skin sarcoid following the administration of neoarsphenamine. Many other methods of treatment have been attempted, but with little success. Among these are the other arsenicals, massive doses of vitamin C, chaulmoogra oil, gold salts, tuberculin, iodides, hyperthermia, and various radiations. With the possible exception of arsenic, none of these has proved to be of any value.

The writer's only observation concerning treatment is that in three cases presented here very striking symptomatic improvement took place after a prolonged rest in bed. In one case each of her three periods of remission of

symptoms occurred after periods of four to six weeks of bed rest. In each instance the remission lasted for several months.

CASE 1

Pulmonary sarcoidosis.—E.T., a student nurse aged 20, was admitted to St. Michael's Hospital on October 3, 1943, complaining of persistent productive cough and loss of weight. Since childhood she had suffered from frequent colds and cough with little sputum. For about a year the cough had been severe with two ounces of greyish sputum daily. In this year she had lost about six pounds in weight. In September, 1942, on entering the School of Nursing, x-ray of the chest showed heavy bronchial markings, and a radiological diagnosis by Dr. E. H. Shannon of chronic non-tuberculous infection was made. At this time the intracutaneous tuberculin test with 1/20 mgm. O.T. was positive. In March, 1943, because of a presumptive clinical diagnosis of bronchiectasis, bronchograms were made and revealed well marked saccular and cylindrical bronchiectasis involving the left lower lobe. Lobectomy was advised. On admission to hospital her temperature, pulse and respirations were normal. The blood pressure was 110/70. The hæmoglobin was 80% and the leucocyte count was 8,000. Tubercle bacilli could not be found in the sputum and the urine was normal. On physical examination slight dullness was found on percussion over the lower lobe of the left lung, and in this area patches of bronchial breathing and scattered râles were heard. There were no other abnormal findings. The tuberculin test with 1/20 mgm. O.T. was now negative.

On October 4, the lower lobe of the left lung was removed by Dr. W. G. Carscadden. At operation it was noted that there were many firm circumscribed nodules scattered over the surface of the excised lobe. Similar nodules were observed on the under surface of the upper lobe.

A "quick section" of a peripheral nodule showed numerous very large giant cells of foreign-body type surrounded by aggregations of epithelioid cells. Absence of caseation was noted, but a tentative diagnosis of tuberculosis was made. Gross examination of the excised specimen showed a moderate degree of fusiform dilatation of the bronchi and bronchioles with fibrous thickening of their walls. At the periphery of the lobe, immediately under the pleura, were several scattered, greyish yellow, moderately firm, circumscribed areas measuring 1 cm. to 2 cm. in diameter. Radiating out from the root of the lobe, between the thickened bronchioles, were numerous, in places confluent, firm greyish-yellow, sharply circumscribed nodules, varying in diameter up to 0.5 cm. The intervening lung tissue appeared normal. On examination of paraffin section a diagnosis of sarcoidosis was made.

Many sections were examined for tubercle bacilli with negative results, and a guinea pig heavily inoculated with tissue from the pulmonary lesions failed to develop tuberculosis. The final diagnosis was pulmonary sarcoidosis and bronchiectasis.

The patient's postoperative course was satisfactory and she was discharged from hospital in good physical condition on November 10. Relevant laboratory data are summarized in Table I. X-ray examinations of the bones of the hands and feet, early in December, showed no abnormality. On December 16 a tuberculin test with 1 mgm. O.T. was again negative. At the time of writing (1946) the patient is in good health, is working full time, and except for a slight cough, is free of symptoms. Her reaction to tuberculin remains negative to 1 mgm. O.T.

CASE 2

Sarcoidosis of the lymph nodes and tonsils.—R.R., a male patient, aged 41, consulted Dr. Harris McPhedran in March, 1931, complaining of swellings in his neck, which had been present he thought, for about six months. They had seemed to occur quite suddenly at the time and to have receded to some degree subsequently.

On examination the patient appeared to be in good general health. The tonsils were swollen and appeared to be inflamed. The pharynx was reddened and muco-pus in abundance was observed. There was an appreciable degree of swelling of the lymph glands in the neck, the axillæ and the groin, the glands varying in size up to that of a hen's egg. Urinalysis was negative. Routine blood examination showed no abnormality. The Wassermann was negative.

On March 17, a cervical lymph gland was excised and the pathologist reported that the picture was that of atypical tuberculosis in a lymph gland. On March 28, tonsillectomy was carried out and the tonsils examined pathologically. The diagnosis was chronic tonsillitis showing foreign body giant cell reaction. Guinea pigs and fowl inoculated with tissue from the lymph node and tonsil failed to develop tuberculosis.

On re-examination of the section in this case, in 1943, the pathologist recognized that the lesions in the lymph node and tonsils were typically sarcoid in type. This patient was, in December, 1943, alive and well.

CASE 3

M.W., female, aged 35 years, was admitted to St. Michael's Hospital on October 28, 1945. She complained of persistent cough with sputum of two years' duration, dyspnœa for two years, fatigue and weakness for eight years and intermittent loss of weight for six years.

In 1937, she suffered from severe pain in the upper chest anteriorly. After x-ray examination of the chest she was told she had Hodgkin's disease and a course of radio therapy was administered. She had no knowledge of any superficial glandular enlargement at this time.

In 1939, she was admitted to another hospital where it was noted that she had generalized enlargement of the superficial lymph glands. An enlarged gland was removed from the posterior cervical region for biopsy and the patient was informed that she had glandular tuberculosis. After eight weeks in hospital she returned home, feeling well. She continued to feel well for about a year. In the summer of 1943, she complained of per-

TABLE I.

	Date—1943					
	Oct. 4	*Oct. 6*	*Oct. 13*	*Oct. 21*	*Nov. 10*	*Dec. 3*
Serum protein gm. per 100 c.c.	..	6.0	..	..	8.5	9.4
Serum albumin gm. per 100 c.c	..	3.2	..	..	4.2	5.2
Serum globulin gm. per 100 c.c.	..	2.7	..	..	4.2	4.2
Serum calcium mgm. per 100 c.c.	..	..	..	..	..	12.2
Phosphatase, King-Armstrong units	..	..	..	..	..	5.8
Hæmoglobin %	80.0	60.0	70.0	75.0	..	84.5
Leucocyte count	8,000	18,000	24,000	..	..	10,300
Neutrophiles	..	..	..	72.5	..	56.5
Lymphocytes	..	..	..	13.5	..	29.0
Monocytes	..	..	..	8.5	..	6.5
Eosinophiles	..	..	..	5.5	..	8.0
Sedimentation rate, Walton tube, mm. in 1 hour	..	..	..	..	..	15

sistent pain in the chest. This pain was continuous, aching in character and situated behind the lower end of the sternum. In September, 1943, following a severe "cold" she became acutely ill and was told that she had pneumonia involving the lower lobe of the left lung. Since then her cough has persisted, has been severe at times and is sometimes productive of green or yellow sputum.

In the spring of 1944 she experienced severe pain low in the left axilla and was told that she had pleurisy. In March, 1945, she was seized with an extremely severe pain in the left lower chest, accompanied by dyspnœa and dizziness. She fell across a table and was unable to move until she was given an injection. She described the pain as being "as though something had become twisted". The pain subsided gradually over a period of five or six days.

At the time of admission to St. Michael's Hospital the patient was pale, not apparently acutely ill but slightly short of breath. Her temperature and pulse were normal, her respirations slightly increased. Her state of nutrition was fairly good. There was slight clubbing of her fingers. On examination of the chest there was found a slight thickening and roughening of the seventh and eighth ribs over a small area in the posterior axillary line. There was diminution of resonance over the left upper lobe anteriorly and posteriorly. Expiratory and inspiratory rhonchi were heard throughout the lungs on both sides. The liver was barely palpable and was not tender. The spleen was not palpable. There was generalized enlargement of the superficial lymph glands. These glands were firm, discrete, not tender and not attached to skin or underlying structures.

During the patient's stay in hospital her temperature was normal, except for an occasional rise to 99°. Her pulse ranged between 80 and 100, and her respirations between 18 and 24.

The laboratory findings were as follows: hæmoglobin 69%; red blood cells 4,000,000; white blood cells 13,800. Two blood films showed no abnormality other than a slight microcytic anæmia. The differential count was normal. The sedimentation rate was 21 mgm. in 1 hour (Walton). The tuberculin reaction was negative with 1/20 mgm. O.T. and was very slightly positive to 1 mgm. Urinalysis on repeated specimens showed no abnormality. The sputum was negative for *B. tuberculosis.*

Certain biochemical estimations were made with the following results: calcium 9.7 mgm. (normal), phosphorus 2.2 mgm. (slightly low), alkaline phosphatase 5.7 units, and on second occasion 6.9 units (both normal). On October 29 the serum protein was 5,600, which is slightly low. On November 7, the serum protein estimation was 6,060, the serum albumen 3,952 and the serum globulin 2,108. These estimations are all slightly low but present a normal albumen-globulin ratio. Bilirubin estimations were direct-negative, indirect 1.3, which is slightly higher than normal.

On October 28, an x-ray of the chest was made and was reported as follows: "The lung roots are rather heavy and moderately broad. The left contains a few small calcified glands. The left lung shows slight fibrosis along the lines of the first interspace trunks with a minute fibrosed nodule at the second rib anteriorly. There is partial collapse of the right upper lobe. There is infiltration or fibrosis opposite the first and second interspace extending along the linear markings well out to the periphery. It appears to be of old tuberculous character. Elsewhere the lung appears clear. The sixth, seventh and eighth ribs have evidentally been fractured and have healed by bony union."

On October 30, x-rays were made of both hands and feet. They presented a normal appearance. On October 31, the right epitrochlear gland was removed for examination. The microscopic diagnosis was sarcoidosis of lymph node. On November 7, a further biopsy was made of a portion of the seventh rib. This was found to be a periosteal fibrous nodule. There was no evidence of sarcoid tissue.

CASE 4

A.C., A white female, aged 66 years, was admitted to St. Michael's Hospital on February 1, 1946. She complained of non-productive cough for five days, general malaise, weakness, and night sweats for the same period.

In November, 1936, she was admitted to hospital with neuroparalytic keratitis of the left eye. The left eyelid was sutured. She was afebrile. Examination of her chest was reported normal. She was again in hospital from March 27, 1940 to April 30, 1940, complaining of a "chest cold" for one week with chills, non-productive cough, general malaise and weakness. At this time examination of her chest revealed diminished movement on the left, normal resonance throughout, reduced air entry in the left upper lobe with râles in the same situation.

There was no history of cough prior to the onset of this illness, no hæmoptysis, no chest pain, and no night sweats. She had lost some weight. Chest x-rays showed the trachea shifted to the left. There was an irregular density involving the left chest from the apex to the level of the eighth rib posteriorly, produced by dense fibrosis, the appearance being very suggestive of tuberculous disease.

Wassermann and Kahn reactions were negative. Blood culture was sterile. The sedimentation rate was 12 mm. in one hour. Eleven specimens of sputum were negative for tuberculosis. She was persistently febrile throughout her stay in hospital, her temperature varying from 99 to 101°. A diagnosis of pulmonary tuberculosis of the chronic fibrosing type was made and the patient was moved to the Mountain Sanatorium, Hamilton, on April 30, 1940. She remained there until October, 1940. During this period all sputums by direct examination, on culture and after gastric lavage, were negative. At the time of her discharge she had no cough or sputum and had gained twenty pounds in weight.

On physical examination, during her recent admission, it was found that the patient was markedly wasted. She had bilateral keratitis with cataract formation. In the chest bronchial breathing was heard over both upper lobes and there were râles at both apices. There were no significantly enlarged lymph glands. Physical examination otherwise was essentially negative.

At the time of admission her temperature was 101°, and continued to range from 99 to 101° throughout her stay in hospital. Her pulse varied from 80 to 100, her respirations from 20 to 24. The hæmoglobin was 73%. The leucocyte count was found on different occasions to vary from 6,450 to 11,650. The differential count was as follows: neutrophiles 58%, lymphocytes 26%, monocytes 7%, and eosinophiles 9%. The red cells showed no abnormality. The urine was normal. The Widal reaction was negative for *B. typhosus,* paratyphosus A. and B., and *B. abortus.* Blood culture was sterile on two occasions. Urine culture was negative. Her sedimentation rate was 30 mm. in one hour. Tubercle bacilli were not found in one specimen obtained by the direct method or in two specimens obtained by gastric lavage. Serum protein estimations done on four occasions showed the total to vary from 6,620 to 8,130. On all occasions there was a reversal of the A.G. ratio, the most striking being, albumen 1,650 against globulin 4,970.

X-ray of the chest revealed no appreciable change as compared with the 1940 and subsequent pictures. X-rays of the hands showed some rarefaction, with small cyst-like areas in the heads of the metatarsal bones. These findings, while not sufficiently clear-cut to be diagnostic, were highly suggestive of sarcoid bone changes.

Throughout her course in hospital the patient insisted that she felt well. Her appetite was good. She had no special symptoms. Three courses of penicillin, of 3, 5, and 8 days' duration, did not influence the clinical picture to the slightest degree. No other treatment was attempted.

DISCUSSION

In the first report a case is presented in some detail in which the diagnosis could not have been made except by direct examination of the viscus or viscera involved. The second case, showing sarcoid nodules in the lymph nodes and tonsils, is of the type described by Schaumann as lymphogranulomatosis benigna. In the third case the diagnosis was suggested by the history, supported by physical and radiological examination, and finally confirmed by examination of an excised gland.

The fourth is presented as one in which the diagnosis of sarcoidosis has not been finally proved but which, in my opinion, presents strong clinical evidence for such a diagnosis. The most important features are the long drawn out chronic course with regression, the early history of keratitis, the unusual lung infiltrations, the failure at any time to find tubercle bacilli in the sputum by direct examination, on culture or by guinea pig inoculation, and finally the negative tuberculin reaction. Findings of some interest but of lesser importance are the increased sedimentation rate, the moderate eosinophilia and the persistent reversal in the albumen-globulin ratio of the blood.

The four cases reported emphasize the chronic character of sarcoidosis and the tendency to spontaneous regression. In the first case, three years after the diagnosis was made, the patient is alive, well, working, and exhibits no signs or symptoms of the disease nor has any of the previously discussed biochemical changes; in the second, twelve years have elapsed since diagnosis and he, also, is alive and well; in the third, nine years have elapsed since the mistaken diagnosis of Hodgkin's disease was made and, though the patient is not at the present time free of symptoms, she has had intervals when symptoms have been absent, and her condition has not appreciably worsened over the whole period; in the fourth case ten years have elapsed since the keratitis was recognized and, while the patient is not well, her general condition has deteriorated very little despite the fact that for at least fifteen weeks she had had persistent high fever, the daily average range of temperature being from 99 to 102 degrees.

Opinion is divided as to whether sarcoidosis is a disease due to an unknown agent (Snapper, Longcope[12]), a reaction to the lipoid fraction of a variety of organisms (Harrell) or a peculiar form of tuberculosis (Boeck, Schaumann, Klemperer,[13] Pinner,[14] Reisner, Tice and Sweany). Belief in the tuberculous nature of the disease is based on the superficial resemblance of the tissue changes to those found in tuberculosis, the infrequent finding of tubercle bacilli in sarcoid lesions, and the occasional finding of typical sarcoid nodules and typical caseating tubercles at one time or at different times in the same case. In opposition to this view it can be argued that the great majority of workers have failed to demonstrate tubercle bacilli in sarcoidosis, and that the tuberculin test is usually negative in this condition. In regarding this argument an analogy might be made with silicosis which produces a similar mass effect in the lung through its slowly destructive action by a chronic inflammatory process. In this disease, a large proportion of patients die ultimately from pulmonary tuberculosis. It might be argued that this is evidence of the tuberculous etiology of silicosis which would, of course, be nonsense.

In considering the tuberculin anergy found by all workers in most of these cases it is of interest to note that in the first case of pulmonary sarcoidosis reported here the tuberculin test was strongly positive with 1/20 mgm. O.T. when the patient entered the School of Nursing, but one year later, when the diagnosis of sarcoidosis was made the test was negative with 1/20 mgm. O.T. and with 1 mgm. O.T. It is also of interest that Lemming[15] could not produce tuberculin sensitivity in patients with sarcoidosis even by injection of B.C.G. vaccine. This certainly suggests that patients with sarcoidosis have a high degree of immunity to tuberculosis.

I am indebted to Dr. William Magner for the pathological reports in the two cases presented, to Dr. Harris McPhedran for permission to publish the second case, and to Dr. J. M. Dunsmore for his assistance with the radiological description.

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RÉSUMÉ

La sarcoidose est un état chronique ayant tendance à régresser spontanément. On a cru qu'il s'agissait d'une forme bénigne de tuberculose: concomitance occasionnelle des deux et ressemblance morphologique des lésions. Par ailleurs, les malades atteints ont le plus souvent une cutiréaction négative. En réalité, l'étiologie est inconnue. La maladie est favorablement influencée par l'arsenic, la chrysothérapie et les rayons X.

JEAN SAUCIER

EVALUATION OF X-RAY EVIDENCES OF SINUS DISEASE*

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ROENTGENOGRAPHIC shadows of the nasal sinuses are more complicated, are crowded into a smaller space and are given to more overlapping than those of any other region. Their interpretation requires care and time and, to my mind, a constant personal comparison between nose and film.

The nose being essentially a bony region, the roentgenogram is characterized by bone shadows; but at the same time the more delicate, the more recent and hence the more clinically important changes can often be detected only in soft tissue shadows.

If one stops to consider that in the lateral view, for example, the soft parts of the external nose are completely obliterated while the bones stand out delicately and clearly, it becomes readily apparent that soft structures within must be either fairly bulky or of a special character in order to cast shadows with exposures based upon bone densities.

In training oneself to recognize the minor variations which are so important it is only common sense to demand a standard exposure technique, including time, voltage and angulation for each position. Long familiarity with films produced under such conditions alone enables one to detect the minor changes as they occur.

In examining a sinus film one naturally turns first to the bones, their character, their density and their outlines. As just observed, changes in the bone are not the earliest manifestations of most nasal diseases; bone changes demonstrable by x-ray are apt to be late. During a given illness, unless one has access to films made of the patient at some previous time under the same relative radiological conditions, one has no way of knowing whether some local density is recent or not. It may be the result of an old periosteal thickening, produced by some infection of ten years ago, which will always remain. We know that maxillary sinuses which have been exenterated at some previous time and are now clinically healthy may cast dense shadows. Density of bone may be due to developmental causes acting in childhood and adolescence, and unrelated to any local nasal affection.

In the diagnosis and examination of fractures roentgenological evidence is usually superior to any other. Its advantages here are too obvious to detain us.

The demonstration of fluid levels in a sinus is dramatic but unfortunately they occur much less frequently than the conditions which can produce them. This is sometimes due to lack of density of some fluids, but is much oftener due to the lack of fluidity, causing the exudate to adhere to the walls where they accumulate in irregular masses or where they are obscured by the irregularities in the bone itself. Exudates may be stretched along the wall toward the ostium by the action of the cilia still functioning in the cavity. The evacuation of radiopaques in this manner is frequently seen. Fluid levels when seen during acute infections are of interest but add little new information. They are of special value in chronic conditions, notably those arising from infected dental roots in the presence of obstructed ostia which prevent the exudate from escaping and showing itself in the nose.

On the whole roentgenological evidence in acute inflammatory conditions is apt to be either inconclusive or superfluous. An acute infection of such severity as to produce demonstrable changes usually asserts itself vigorously and is located quite definitely by the patient.

As a check after the subsidence of the disease, also, the x-ray is less helpful in the nose than in other locations. If there is density while the patient is ill which clears when he recovers, then we are satisfied; there is no guarantee, however, that small abscesses or infected glands do not persist in the membrane which are a potential source of trouble. On the other hand, if the density persists after

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the patient is clinically completely recovered, we are not justified in doing anything about it for that reason alone, which leaves us exactly where we were.

If it should happen that the patient is not clinically improved and the clinical signs point to the offending sinus, then we proceed regardless of the x-ray shadows. If these are dense, we have learned nothing new; if they appear clear, we are still not assured that the sinus is unaffected. In the evaluation of actual bone changes, such as osteomyelitis, the value of the roentgenogram is unquestioned.

Most useful to the rhinologist in his daily work are the shadow outlines of the membranes, since they give one a much more recent and a much more detailed account of what is going on. If the areas are fairly large or fairly dense, or both, which is to say if they are fairly obvious, they can be diagnosed and evaluated without the aid of a radiopaque medium. A few roentgenologists who have shown a special interest in sinus work have developed remarkable proficiency in demonstrating and interpreting soft tissue changes in the sinuses. In my own experience small and important differences in the membrane outlines are very much better delineated by means of lipiodol or some similar contrast medium. Beyond this obvious advantage, the oils become an index to the ability of the sinus to empty itself—a piece of fundamental physiological information of great clinical use—which no amount of training can enable one to determine without them.

Radiopaques, by bringing them into sharp relief, greatly simplify the study of membrane outlines. Four things are to be noted: the characteristic outline of the membrane, the extent to which it follows the bone outline, the thickness of the membrane and its density.

In general it may be said that an extensive thickening of low density and showing large convexities denotes a recent process, that is, an allergy or an acute infection. If there is only a single large convexity and the rest of the membrane is of some other nature, then a cyst is suspected. Retained secretions are not mistaken for membrane thickenings because their outlines are not convex. A shadow which is dense but not very thick and whose outline follows the bone outline indicates a hyperplasia or fibrosis of the membrane.

The emptying time is clinically important. A sinus which cannot keep itself clean is always a menace. If one prefers to introduce the oil through the ostium with a cannula, this can usually be done in the maxillary or the sphenoidal sinuses, occasionally in the frontal. So far as I know the only way of filling the ethmoidal cells is by the displacement method, which to my mind is preferable in any case since it demonstrates all of the sinuses at one time and does not vitiate the results by irritating the ostia.

Emptying time with the solutions commonly used is approximately 96 hours. For clinical purposes the 72-hour period is more practical and quicker.

For a long time I thought that I was using contrast media only in selected cases. Before long I found myself "selecting" every case so that now it has become routine in my office practice. I do not mean to imply that I make an x-ray study of every sinus case—not by any means. But when roentgenographic studies are necessary, they are always made with radiopaque oils, and in six standard positions.

The interpretation of roentgenograms of the sinuses can never be routine. As stated at the outset, the shadows are complicated and variable, as are the talents of the technician and the interpreter. I can only repeat that if properly conducted, roentgenographic study is more informative and deserves more attention than is usually accorded it.

RÉSUMÉ

La radiographie des sinus est difficile. L'interprétation des ombres est compliquée car celles-ci sont variables. L'étude des tissus mous prime en importance celle du squelette. Les huiles radiopaques aident singulièrement à délimiter le relief des surfaces enflammées et à préciser leur épaisseur et le degré de leur congestion. Les huiles radiopaques rendent les mêmes services pour les cavités sinusiennes.

JEAN SAUCIER

Large-scale case-finding is handicapped so long as our major diagnostic technique for syphilis is regarded by the public as inconvenient. A radically improved test would solve many problems in case-finding. The test which we need should be fast, painless, specific, sensitive, and simple. It may be that this new test will be found through the combined and co-ordinated effort of the best scientific minds.—R. A. Vonderlehr and J. R. Heller, *The Control of Venereal Disease.*

THE IMPORTANCE OF CORRECT DIAGNOSIS IN SUPERFICIAL RADIATION THERAPY OF BENIGN SKIN DISEASE*

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IN presenting a paper on some aspect of superficial radiation therapy, it may appear strange that I should ignore the purely radiological side of the matter, such as methods of treatment, dosage, physical factors and so on, and discuss mainly some points in diagnosis in the use of x-ray therapy for the treatment of benign skin disease. However, not the actual diagnostic features are to be discussed, but the importance of having a correct diagnosis made, if at all possible, before x-radiation is administered. If it should seem unnecessary to speak on something which appears to be obvious, I may say that this presentation is prompted by and based on the mistakes encountered and made in more than two years spent doing the radiotherapy of skin disease for our armed forces overseas.

The question of diagnosis may seem to be of no concern to the radiotherapist. The patient is referred for appropriate x-ray treatment of his disease. Most dermatologists do their own radiotherapy, and so that group of cases, usually labelled more scientifically, is not seen by the radiologist. Most x-ray therapists, however, do have many patients referred for treatment by physicians who have treated their own dermatological problems, or in centres where there is no skin specialist to administer this form of therapy. Thus it is important that the radiologist have some knowledge of the skin conditions which he may be called upon to treat.

Too many times, the terms eczema, chronic eczema, dermatitis and other similar general terms are used to classify a patient's skin lesion without regard to etiology. While it is true that in some cases, by the time the patient is seen, one cannot be very exact in his diagnostic terminology and must use the unqualified term of eczema or dermatitis, still in quite a large proportion of such cases seen overseas it was possible to make a more exact diagnosis. In some instances this resulted in a revision of our ordinary technique of treatment, while in others sent for radiotherapy, it was found that such treatment was contraindicated. Often the diagnosis has a direct bearing on the prognosis. The technique may vary, and if all types of eczemas are treated in a similar manner, some of these patients may not obtain as much benefit from their treatments as they might have received if the technique had been altered to suit their individual type of disease. In some cases, during the course of radiation therapy, the undiagnosed irritant factor may still be active and produce exacerbations which may result in placing the blame on the x-rays as the agent at fault, and may lead occasionally to the accusation that the patient had been burned and that the radiologist has been negligent.

Not only the diagnosis of a pathological condition must be known, but it is important also to be aware of the natural history of the disease, and to assess the stage in the normal cycle at which it is being seen, the degree of acuteness and any other factors which may determine the technique to be used in treating the patient.

Some of the diseases will now be discussed under various diagnoses, locations, etc., with examples of some mistakes made which may have resulted in failure if unrecognized.

CONTACT DERMATITIS

This group includes the various types of skin lesions produced by some chemical or physical irritant, such as occupational dermatitis, cosmetic dermatitis, rubber dermatitis, sensitivity to drugs, metals, sunlight, etc. If the causative agent can be discovered and removed soon enough, the pathological changes may disappear without further attention. If these have progressed far enough, some dermatological treatment will be required before healing can occur. In some, this may be insufficient and radiotherapy is necessary. The pitfall in these cases is that even if the active factor is not eliminated, temporary improvement can be obtained with the use of x-rays. Then recurrences develop and eventually a stage is reached where such further treatment is unwise and the patient is left with a chronic annoyance or disability. The following cases are a few examples of mistaken diagnoses in this group.

CASE 1

A female, aged 26, gave a history of a recurrent eruption for two years, involving mainly the axillæ, occasionally the face and ears. On one occasion, three years ago, the scalp had shown a little eruption. She was referred for radiotherapy with a diagnosis of sebor-

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rhœic dermatitis. Further questioning revealed the use of a deodorant which had brought on the latest attack. Examination showed some reddening, scaling and slight thickening in the axillæ with similar but clearing changes on the face. Patch tests were positive for her face powder and for the deodorant. Their use was eliminated, two x-ray treatments were given to aid in the resolution of the eczematous changes, the condition cleared rapidly, and no recurrences had appeared up to the time of her last examination nine months later.

CASE 2

A male, aged 33, was referred for treatment of an eruption on the ring finger of five months' duration. Diagnosis, chronic eczema. No definite cause could be determined, although he did come in contact with grease and oils in the workshop. Some improvement was obtained with x-ray therapy. But the lesion would not clear. A ring worn on that finger and removed only during treatment, was transferred to the left hand and in less than a week, a similar eruption appeared on this finger. Patient was sensitive to the metals in his ring. After its removal, the eruption on both hands cleared with a little more radiotherapy, and had remained clear when seen five months later.

CASE 3

A male, aged 30, was referred for x-ray treatment of neurodermatitis of the antero-lateral surface of the left thigh. Duration; eleven months. Treatment with a variety of ointments had produced only occasional improvement. The lesion measured 6″ by 8″. The dermatologist noticed that this area was directly beneath the pocket of his trousers, where amongst other things, he had always carried a box of matches. Patch tests with the striking portion of the match box were positive. The causative agent was removed, and the lesion cleared on x-ray therapy, leaving some pigmentation. The last examination two years later still showed the same discoloration, but the leg had remained clear of eruption.

CASE 4

A female, aged 30, was referred for treatment with an intermittent eruption of three months' duration. This usually began on the chin and spread to the cheeks. The eyelids became very swollen suddenly on three occasions. The history and the appearance of the lesion were suggestive of a contact dermatitis. No new cosmetics, soap, medicine, etc. had been used. Patch tests of nail polish and face powder, and all protein intradermal and scratch tests were negative. As the lesions did not clear completely on ordinary dermatological measures, a small dose of x-rays was administered. Two days later a flare-up occurred, with reddening and weeping of cheeks and chin, and œdema of the eye-lids. The radiotherapy was blamed and further treatment was stopped. The skin changes subsided slowly. A second flare-up occurred several days later. The whole history was then reviewed and it was noted that the powder puff, made of some rubber compound had not been tested. A patch test with this produced a very strong positive reaction. When this agent was eliminated, the skin changes cleared.

With the widespread use of sulfonamides, many cases of sulfonamide dermatitis have occurred. Some of these eventually find their way to the radiologist for treatment. Usually there is no difficulty in the diagnosis and management of these cases. But in a few a sensitivity to sunlight has developed and in some is unrecognized so that repeated exposures have resulted in the development of a dermatitis on the face. Some of these patients respond well to x-radiation. But they must be protected during the period of treatment otherwise failure may result, or a flare-up may be attributed to the injudicious use of x-rays.

ECZEMATOUS AFFLICTIONS OF THE HANDS AND FEET

There is a tendency to label nearly all eczematous involvement of the feet as epidermophytosis or "athlete's foot". If lesions also involve the hands, these are then considered to be "id" reactions. Often these turn out to be cases of severe hyperhidrosis with maceration between the toes, and are usually unsuitable for radiotherapy. Furthermore, straight-forward cases of fungous infection of the feet can be treated by other dermatological means. If secondary eczematization occurs, this may require radiotherapy but with this form of treatment the original fungous infection usually remains unaffected, and the condition will recur later unless proper medical procedures are followed.

Dyshidrotic eczema or pompholyx of the feet or hands or both is another disease entity often mistakenly diagnosed as fungous infection. This is a stubborn condition to treat, showing frequent early recurrence. Repeated irradiation because the first application proved successful in clearing the itch and eruption may lead to eventual overtreatment with disastrous consequences. There appears to be some psychological disturbance present in some of these patients, and some of those seen by us overseas were referred for psychiatric examination. If any such factors can be corrected, there is more hope of achieving a more lasting improvement.

Other pathological conditions such as contact dermatitis, impetiginous dermatitis and neurodermatitis of the feet and hands should be recognized as possibilities when a case of "eczema" of these areas is referred for radiotherapy.

CRURAL LESIONS

Very often any lesion involving the crural areas is diagnosed as tinea cruris, particularly if the involvement is fairly sharply circumscribed. Furthermore, nearly all of these cases are treated without first examining scrapings for fungus, or without taking an adequate history to rule out the presence of other skin disease elsewhere, of which the crural involvement may be only a part. The presence of a lesion on the toes, even if proved of fungous origin, does not necessarily indicate that other lesions on the body are of similar etiology. Quite a few derma-

tological entities may produce eruptions in the crurals, which may or may not be accompanied by similar involvement elsewhere on the body. Some of the crural conditions encountered in our practice overseas were neurodermatitis, chronic patchy eczema, atopic dermatitis, tinea cruris, seborrhœic dermatitis, psoriasis, and contact dermatitis due to overtreatment of other skin diseases.

Strong fungicidal ointments may so aggravate some non-mycotic lesions that a disease which normally might be expected to benefit from x-ray therapy may become more resistant to such treatment. And tinea cruris, mistakenly labelled something else, may be given a prolonged course of radiotherapy with very little benefit to the patient.

CASE 5

A 39-year old male was referred for treatment of a crural lesion which had been thought of as possibly tinea cruris. Six months before, he had developed "athlete's foot" and impetigo of the face, and soon an eruption appeared in the crural areas. The feet and face cleared with treatment but the other lesions remained. The use of Whitfield's ointment made him much worse. Bland ointments then produced a little alleviation of his distress. When seen here, numerous greasy scales were seen in his scalp, some redness and scaling were noted in the sternal area, the intergluteal cleft, and in each crural fold, worse on the left side. A diagnosis of seborrhœic dermatitis was made. Radiotherapy was administered and the lesions responded, but very slowly. However they cleared and had remained clear until examined again nearly two years later.

CASE 6

A male, aged 40, was referred for treatment of a crural lesion diagnosed as eczema. Duration, six weeks. Ointments had produced no improvement. Examination revealed eczematous appearing lesions which showed no clinical resemblance to tinea. X-ray therapy was started. Routine examination of scrapings revealed fungous organisms. Radiotherapy was stopped, and the disease was soon eradicated by proper dermatological treatment.

PLANTAR WARTS, CALLUSES AND CORNS

In my opinion, calluses and corns are problems for the orthopædic surgeon and not for the radiologist. Although it is possible to be temporarily rid of some of these by means of irradiation, the underlying cause, some disturbance in the normal architecture of the foot, is still present, and recurrences are not prevented. Repeated treatments of a callus, mistakenly diagnosed as a plantar wart, have not infrequently resulted in the formation of a painful radiation ulcer. Failures and complications as noted above have often led to condemnation of radiotherapy as a method of treatment of plantar warts.

Further examples could be given to illustrate the main point of this paper but time does not permit. One thing however I would like to add. It is very important to assess the degree of acuteness of a lesion. If it is necessary to administer x-rays to a somewhat acute eczematous condition, because no other treatment has brought any relief, a much smaller dose is necessary than is used for a more quiescent and more chronic state. Otherwise, a severe flare-up may result, producing increased distress to the patient, and in some cases more serious complications may follow.

The main object of any form of therapy is the complete eradication of a disease condition in order to restore a patient to normal. If this is impossible, then one endeavours to produce as much relief for as long a period as possible. This aim, however, can be defeated, or the benefits desired decreased by mistakes in diagnosis, and by improper assessment of other factors such as the degree of acuteness of a disease, its location, the presence of other pathological conditions, and so on. Most of the mistakes which we encountered in our practice overseas were due to inadequate history taking and to incomplete physical examination.

A NUTRITION SURVEY AMONG SCHOOL CHILDREN IN BRITISH COLUMBIA AND SASKATCHEWAN

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MORE deaths ascribed directly to nutritional deficiency diseases occurred in Canada in 1944 than from poliomyelitis. The following table, which has been newly compiled from figures supplied by the Vital Statistics Branch, Dominion Bureau of Statistics, shows that 42 people died of rickets, pellagra, beri-beri, and scurvy in Canada in 1944, and this may be compared with 38 deaths from poliomyelitis. The number of cases of poliomyelitis reported in 1944 was 722 and it is generally believed that many cases go undiagnosed; this may be even more true of malnutrition. Similarly, malnutrition leaves permanent disability in a proportion of cases, and definitely lessened health and

working ability in others. The difference is that our present knowledge is sufficient to avoid malnutrition, yet it continues to take a toll of death and disability.

TABLE I.

NUMBER OF DEATHS ASCRIBED DIRECTLY TO NUTRITIONAL DEFICIENCY DISEASES IN CANADA, EXCLUDING REMOTE AREAS, 1929 TO 1944

	Scurvy	*Beri-beri*	*Pellagra (non-alcoholic)*	*Rickets*	*Osteo-malacia*
1929.....	5	2	8	203	*
1930.....	7	0	3	200	*
1931.....	5	1	8	102	4
1932.....	10	1	6	95	1
1933.....	2	1	8	66	5
1934.....	6	0	1	72	4
1935.....	10	3	3	51	5
1936.....	12	1	2	68	5
1937.....	7	1	2	54	5
1938.....	11	1	2	61	4
1939.....	11	2	6	49	4
1940.....	6	1	3	66	5
1941.....	3	4	4	48	5
1942.....	2	3	2	45	1
1943.....	6	1	4	37	*
1944.....	4	1	3	34	*

*Not available.

To date there is no comprehensive idea of the amount or kind of malnutrition in Canada.[1] Such knowledge is important if levels of nutrition are to be maintained and improved according to reasonable plans and with economy of effort. It is important to the practitioner by indicating the background of the population from which his patients are drawn.

The present report is the first of a series which, it is hoped, will give a reasonable picture of the nutrition problem among younger school children. It is the first attempt in Canada to utilize dietary records, blood tests and clinical examinations on a scale large enough to be representative of regions, and to integrate the findings on each individual in an attempt to diagnose several types of deficiency. The results permit generalizations even for a Province, indicating the type and extent of the nutrition problem and methods for dealing with it. A nutrition survey team from the Nutrition Division of the Department of National Health and Welfare, Ottawa, is available on request to work with Provincial and local personnel. The methods used constitute an adaptation and integration of methods currently used in the United States and in Great Britain, as a result of personal contact with investigators in both countries. Special attention is paid to the representativeness of areas and samples. All pertinent data on each individual are recorded on special cards, permitting multiple correlations, and also permitting the preparation of confidential lists of names for special attention by local personnel.

MATERIAL

British Columbia.—In British Columbia the survey was carried out in January and February, 1946, in co-operation with the Provincial Board of Health, the Metropolitan Health Committee of Vancouver, the British Columbia Red Cross Society, and local personnel. A total of 1,495 pupils in 16 different schools spread among five areas were studied: Vancouver, Nanaimo, Fraser Valley, Caribou, Vernon. An additional 157 Chinese and 26 Sikh children were studied separately. Most of the children were aged 5 to 11 inclusive, the sample constituting 1.74% of this age group in the Province; those in the age group 12 to 14 years comprised 0.32% of that group.

Saskatchewan.—In Saskatchewan the survey was carried out in May and June, 1946, in co-operation with the Department of Public Health and local personnel. A total of 1,465 pupils in 43 different schools spread around five areas were studied: Regina, Swift Current, Rosetown, Prince Albert, Foam Lake. Most of the children were aged 5 to 11 years inclusive, the sample being 0.85% of this age group in the Province; those in age group 12 to 19 years comprised 0.25% of that group in the province.

Dietary records.—These consisted of a simplified questionnaire form based on the number of servings of each food recommended in Canada's Food Rules, and were kept by the pupils with the aid of parents and teachers during one week. These results would indicate the diet for at least 5 winter months and steps are being taken to balance this picture with results when fresh foods of summer are more available. Ultimately it is expected to make this semi-quantitative food habit enquiry at intervals for at least a year before doing physical examinations.

Physical inspections.—These were shortened by omitting prolonged study of heart and lungs, and concentrating on those parts of the body which are most likely to show signs of malnutrition, namely, (1) the epithelial tissues, as in the skin, tongue, gums, lips and eyes; (2) the skeletal system as in bone formation of head and chest. A diagnosis of malnutrition based on inspection alone was avoided. All findings were considered along with objective signs before a final diagnosis was made. It is believed that this procedure is essential in order to compare results on different population groups and the work of other investigators.

All children were weighed and measured but these figures are for the record only, owing to the uncertainties regarding suitable tables for comparison. *Thinness* of children was estimated by the amount of subcutaneous fat felt or measured in a loose fold of skin over the triceps, allowing for age, sex and build. The term does not necessarily imply underweight. *Carious teeth*, either filled or not, were counted without aid of instruments. Four decayed or filled units were called "moderate", while "marked" meant half the

bicuspids and molars were affected. "Severe" caries was reserved for cases showing few whole teeth. *Posture* was graded by beginning with "moderate" or "bad" if the scapulæ were considerably winged, together with various degrees of kyphosis, compensatory lordosis and protruded abdomen. All doubtful examples of any physical sign were excluded, and signs were definite enough to be readily classified by either examining doctor with the adjectives mild, marked or severe. No obvious thiamine deficiency was found but children are not prone to show signs short of actual beri-beri, so that this aspect of nutrition is not readily covered.

Blood-testing.—This was confined to the possibilities of several drops of blood taken from a finger, analyzed by the micro-methods of Bessey and Lowry, and to the limitations at the time of our laboratory arrangements. A hæmoglobin estimation was carried out at once by the carbonate method in a Cenco battery-operated photelometer. The rest of the blood in capillary tubes was centrifuged, the serum frozen and shipped in dry ice to Ottawa. Ascorbic acid by the micro-Roe method, and serum protein by the kerosene-bromobenzene gradient tube were all that could be done in these surveys.

RESULTS

As explained above the results have been tabulated in the usual way with separate tables on dietary intakes, hæmoglobins, serum protein, ascorbic acid levels, and on the incidence of various single signs of deficiencies. They are omitted here to save space and to concentrate on the approach suggested of combining these results on each individual to give a diagnosis comparable with usual medical diagnoses. These details may be obtained from the authors.

TABLE II.

THE ACCURACY OF THE DIAGNOSIS IS GREATLY INCREASED BY FINDING MORE THAN ONE SIGN OF A PARTICULAR DEFICIENCY IN AN INDIVIDUAL

The last column does not represent the number of diagnosed deficiencies for reasons given in the text.

	Percentage of children in British Columbia showing:				
	One sign	*Two signs*	*Three signs*	*Four signs*	*Total*
Of vitamin A deficiency	19.9	1.7	0	0	21.6
Of riboflavin deficiency	42.1	29.2	9.4	0.8	81.5
Of niacin deficiency	2.3	0	0	0	2.3
Of ascorbic acid deficiency	3.8	0.1	0	0	3.9
Of rickets (healed)	40.3	15.2	1.3	0	56.8
	Percentage of children in Saskatchewan showing:				
	One sign	*Two signs*	*Three signs*	*Four signs*	*Total*
Of vitamin A deficiency	19.9	1.5	0	0	21.4
Of riboflavin deficiency	39.6	11.9	1.6	0.1	53.3
Of niacin deficiency	2.3	0	0	0	2.3
Of ascorbic acid deficiency	12.9	1.0	0.1	0	13.9
Of rickets (healed)	41.4	9.1	0.5	0	51.0

Table II emphasizes the importance in nutrition surveys of considering the prevalence of more than one sign of deficiency in individuals. Few diseases have a single sign which is completely pathognomonic, yet nutrition survey results are frequently reported as though the incidence of even one sign, however unspecific, indicates some kind of mild or "subclinical" deficiency. On the other hand the finding of two or more signs in one individual greatly increases the probability of that person having the disease. It does *not* necessarily suggest a greater severity of the disease. Since the signs of milder nutritional deficiency are not specific, much confusion arises in attempting to interpret tables of the incidence of single signs.

The signs of vitamin deficiencies referred to in Table II included most of the following, but many were not encountered at all in these surveys. *Vitamin A*: xerosis of skin, follicular keratitis, follicular conjunctivitis, conjunctival opacities, pterygium, pinguecula, xerosis conjunctivæ, corneal ulcerations or opacities. *Riboflavin*: pilosebaceous plugs in the naso-labial folds, angular stomatitis either acute or scars, dry lips, cheilosis, "pebbled" tongue, blepharitis (with crusting), lachrymation. *Niacin*: pellagrous dermatitis, hyperkeratosis of elbows and/or knees, denuded papillæ of tongue, red tongue, smooth tongue. *Vitamin C*: red (or purple) gums, swollen gums, bleeding gums, recession or rectraction of gums, folliculitis, perifollicular petechiæ, ecchymoses. *Rickets*: parietal (or frontal) bossing, chest deformities, enlargement of wrist epiphyses.

TABLE III.

SHOWING THE INCIDENCE IN PERCENTAGE IN TWO PROVINCES OF THREE GENERAL CONDITIONS WHICH ARE TO SOME EXTENT RELATED TO POOR NUTRITION

	Moderate		*Marked*		*Severe*	
	B.C.	*Sask.*	*B.C.*	*Sask.*	*B.C.*	*Sask.*
Thinness	14.0	11.0	0	0.1	0	0
Carious teeth	63.0	46.0	11.0	3.6	0.2	0
Poor posture	61.0	41.0	9.0	3.0	0	0

In Table III are recorded three general conditions which are the outcome of a number of factors, one of which is certainly improper nutrition in the case of thinness and carious teeth; poor nutrition may often be a contributing factor in the development of poor posture.

Hæmoglobin.—A detailed study of the hæmoglobin results in British Columbia has been published separately.[2] The average was 12.8 gm. per 100 c.c. blood in a range of 10.0 to 15.7 gm.; this average may be taken as normal for children in British Columbia. A study of the distribution

curve led us to consider all those below 11.9 gm. as anæmic.

In Saskatchewan the average hæmoglobin was 13.3 gm. per 100 c.c. of blood for the 1,456 children on whom results were obtained; this may be taken as normal for children in Saskatchewan. The range was 10.3 to 16.3 gm. While 75% would be 10 gm. the distribution curve suggests that all below 11.9 gm. should be considered anæmic.

Serum ascorbic acid.—In British Columbia the average for all children was 0.57 mgm. per 100 c.c. serum in a range of 0.04 to 2.4 mgm.; about 40% of the children had values below 0.4 mgm. which is taken by some investigators[3] as the lower limit of normal. This finding is in accord with the dietary results and shows little or no reserve supply; it may be related to the winter diet rather than the whole year, since physical signs of C deficiency were not so common, and these need long continued low levels to develop.

In Saskatchewan the average ascorbic acid level was 0.43 mgm. per 100 c.c. serum in a range from 0.01 to 2.0; over 56% of the children on whom results were obtained had values below 0.4 mgm. The same comments as for British Columbia may be applied here.

Serum protein.—In British Columbia the average was 6.9 gm. per 100 c.c. serum, in a range of 3.1 to 10.2 gm. The normal range is stated to be 6.0 to 8.0 gm. %, with œdema appearing at about 3.0. No child was found with œdema, but 18% of the group had values below 6.0 gm. No explanation of the few high values is available at present.

In Saskatchewan the average was 6.8 gm., in a range from 3.4 to 9.8 gm., and only 4% of the children fell below 6.0 gm.

CRITERIA FOR MALNUTRITION

Instead of separate tables on dietary intakes, blood analyses and lists of individual signs these have been combined in various ways to increase the accuracy of the diagnosis of malnutrition. It is recognized that the following criteria are arbitrary, but it is suggested that they yield useful information for a conservative evaluation of nutritional status. Since all our results for each individual are on a single card, it will be easy to reassess the state of nutrition by any new set of criteria which discussion and investigation may develop.

Unfortunately few practitioners will be able to bring together such complete data as used here for diagnosis, but it is hoped that as more surveys are completed in this way, it will be possible for us to work out various correlations making it easier and surer to diagnose milder nutritional deficiencies than can presently be done.

The following are the criteria of malnutrition used for this survey:

1. Any child showing thinness by the criteria used.
2. *Vitamin A*:
   (*a*) Definite deficiency—both of the following: (1) Two physical signs of the three tabulated (xerosis, follicular conjunctivitis, follicular keratitis); *and* (2) a diet record minimum or below in green, yellow and other vegetables.
   (*b*) Probable deficiency—either of the following: (1) two physical signs; *or* (2) one physical sign *and* a diet record minimum or below in vegetables.
3. *Niacin*:
   (*a*) Definite deficiency—both of the following: (1) two physical signs of the four tabulated (hyperkeratosis of elbows and/or knees, denuded lingual papillæ, red tongue, smooth tongue); *and* (2) a diet record minimum or below in whole grain cereals *and* meat.
   (*b*) Probable deficiency—either of the following: (1) two physical signs; *or* (2) one physical sign *and* a low diet record as above.
4. *Vitamin C*:
   (*a*) Definite deficiency—either of: (1) one physical sign of the four tabulated (red or purple) and swollen gums, bleeding gums, folliculitis, perifollicular petechiæ); and a diet record minimum or below in citrus fruit, potatoes, and vegetables; *and* a serum ascorbic acid level less than 0.3 mgm. per 100 c.c.; *or* (2) two physical signs *and* either a low diet record or low serum ascorbic acid as above.
   (*b*) Probable deficiency—either of the following: (1) two physical signs; *or* (2) any combination of two of the following three conditions; (*i*) one physical sign, (*ii*) a low diet record and (*iii*) a low serum ascorbic acid as above.
5. *Riboflavin*:
   (*a*) Definite deficiency—either: (1) two physical signs from the following group: seborrhœic dermatitis, angular stomatitis, cheilosis, pebbled tongue, blepharitis; *and* a diet record minimum or below in milk and cheese; or (2) three physical signs as specified above.
   (*b*) Probable deficiency—either: (1) one physical sign and a low diet record as specified; *or* (2) two physical signs.
6. *Rickets*:
   (*a*) Definite deficiency—either: (1) any recorded chest deformity; or (2) grade 3 bossing of parietal or frontal bones.
   (*b*) Probable deficiency—grade (1) or (2) bossing plus grade 1, 2, or 3 enlargement of wrist epiphyses.
7. *Anæmia*: A hæmoglobin value below 11.9 gm. per 100 c.c. of blood.
8. *Protein deficiency*:
   (*a*) Definite; œdema with a total serum protein value below 6.0 per 100 c.c.
   (*b*) Probable—a total serum protein value below 4.0 grams per 100 c.c.
   (*c*) Possible—a total serum protein value below 6.0 grams per 100 c.c.
9. Underfeeding or dietary inadequacy; a diet record minimum or below in 4 or more of the 8 foods or food groups.

By demanding a multiple correlation of history, signs, and laboratory findings, as is used in other branches of medicine, the diagnosis of "definite" malnutrition is believed to be fairly certain. There was a somewhat larger group who failed to meet these criteria, but who showed one or more suggestive indications. For example, there was a large group showing "dietary inadequacies", which, if characteristic of the diet over a long time probably constitute a transitional area from which are derived actual cases of malnutrition. Other cases are excluded from a "definite" diagnosis by virtue of such points as a good diet history or a high blood level, in the face of some physical signs.

While the diagnoses of "probable" deficiencies are considered to be less certain, yet from the standpoint of health such children deserve just as much attention as those diagnosed "definitely". For these reasons the total public health problem is *the sum* of both the "definite" and "probable" deficiencies. At some future time when much needed research on a statistical basis has further evaluated the signs used it will be possible to express mathematical probabilities for the accuracy of these diagnoses.

The total of all the figures is *not* the total percentage of malnourished children. This will be somewhat less because multiple deficiencies are known to occur frequently.

SUMMARY

1. The first nutrition surveys of their kind in Canada, combining dietary studies, physical examination and blood analyses, were carried out in British Columbia in January and February, and in Saskatchewan in May and June, 1946. About 1,700 school children in the former Province and 1,500 in the latter, scattered among 16 and 43 different schools in five regions in each province were examined. The surveys are designed to assist local and provincial personnel in ascertaining the type and extent of the nutrition problem, and the means of solving it.

2. No scurvy, beri-beri, starvation or other marked deficiency diseases in acute form were encountered. Nevertheless a newly compiled

TABLE IV.
INCIDENCE OF (A) DEFINITE AND (B) PROBABLE MALNUTRITION IN CHILDREN STUDIED IN BRITISH COLUMBIA

	Definite		*Probable*	
Condition	*No. of children*	*% (of 1,495)*	*No. of children*	*% (of 1,495)*
1. Dietary inadequacy	No criteria	—	375	25.2
2. Riboflavin deficiency	32	2.1	274	18.3
3. Thinness	214	14.3	No criteria	—
4. Past rickets	169	11.3	169	11.3
5. Anæmia	114	7.7 (of 1,054)	No criteria	—
6. Vitamin A deficiency	8	0.5	95	6.4
7. Ascorbic acid deficiency	0	0	11	0.7
8. Protein deficiency	0	0	8	0.7 (of 1,223)
9. Niacin deficiency	0	0	1	0.07

TABLE V.
INCIDENCE OF (A) DEFINITE AND (B) PROBABLE DEFICIENCIES IN CHILDREN STUDIED IN SASKATCHEWAN

	Definite		*Probable*	
Condition	*No. of children*	*% (of 1,465)*	*No. of children*	*% (of 1,465)*
1. Dietary inadequacy	No criteria	—	481	31.8 (of 1,513)
2. Riboflavin deficiency	64	4.4	260	17.7
3. Thinness	159	10.9	No criteria	—
4. Past rickets	72	4.9	97	6.6
5. Anæmia	44	3.0 (of 1,456)	No criteria	—
6. Vitamin A deficiency	11	0.8	121	8.3
7. Ascorbic acid deficiency	2	0.1	39	2.7
8. Protein deficiency	0	0	2	0.1 (of 1,395)
9. Niacin deficiency	0	0	0	0

table of deaths ascribed to nutritional deficiency diseases is presented to show that in 1944 (the most recent figures) 42 persons died of such diseases in Canada as a whole, which may be compared with 38 deaths from poliomyelitis in the same year. The two Provinces concerned have recorded 20 deaths from nutritional deficiencies in the last five years for which there are figures. Most of these were ascribed to rickets, which is in accord with the present findings, but pellagra and beri-beri have also been given as a cause of death in these Provinces.

3. The problem is largely one of milder degrees of malnutrition in which there is very little agreement on methods of diagnosis.

4. The number of children showing *dietary inadequacies* was the largest group found in both Provinces. While such diets do not prove malnutrition, yet the criterion of an inadequate diet represented less than half the usual recommendations, and such children undoubtedly represent a transitional group some of which will show definite malnutrition if the diet is eaten for prolonged periods.

5. *Thinness* is at the top of the list of definite malnutrition with 14% in British Columbia and 11% in Saskatchewan. The thin child is presumably not getting enough food for reserves of energy in work or play, or for protection in disease and injury. A low energy supply may require the child to use for energy, protein needed for growth.

6. Definite evidence of *past rickets* was found in 11% in British Columbia and 5% in Saskatchewan, while an additional 11 and 7% probably had rickets in early life. This is consistent with the fact that very few children recorded ever taking fish liver oil. It also suggests a lag between knowledge and its application since rickets is a preventable disease and no child today need suffer from it. Rickets takes a considerable toll in deformed chests, legs, heads and wrists which permanently affect the whole life of the individual.

7. *Anæmia* was judged to be present in one child out of twelve studied in British Columbia but in only 3% in Saskatchewan. In children, this is not to be regarded with complacency.

8. *Vitamin deficiencies*, with the exception of riboflavin, were not very common. While definite riboflavin deficiency was not common in either Province, about one child in five was probably deficient. This compares with a low use of milk, which is our best source of this vitamin, by 16% in British Columbia and 35% in Saskatchewan. While riboflavin deficiency may not be very disabling it is often associated with sore watery eyes and sore lips, among other conditions. Definite deficiencies of vitamin A and ascorbic acid (vitamin C) were rare, while no children were diagnosed as having definite niacin deficiency. Thiamine deficiency was not recorded because it did not prove feasible to assess it. "Probable" deficiencies of these vitamins were more common, while some single unspecific signs occurred in half or more of the children. In Saskatchewan 56% had very low serum ascorbic acid levels, associated with the observed lack of fruit in the diet, while about 40% in British Columbia were equally without reserves of this vitamin, even if not actually suffering the gum changes and other conditions sometimes found. The vitamin A deficiency was characterized chiefly by roughened skin and other findings which are easily preventable.

9. The estimation of malnutrition by the correlation of all evidence on each individual and by the multiple associations in the tentative criteria given are believed to increase the usefulness of the results over ordinary methods of reporting separately the dietary intakes, the blood findings and the physical signs.

10. Of conditions less directly related to nutrition, the most striking incidence of defects occurred in *teeth* and *posture*, both of which were worse in British Columbia than in Saskatchewan.

Grateful acknowledgment is made to staff of the Nutrition Division, Department of National Health and Welfare, Ottawa, as well as to Provincial and local personnel who are too numerous to mention, but whose assistance made these surveys possible.

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Note added to proof: The method of diagnosing mild nutritional deficiencies outlined here is similar to that employed in Italy by J. Metcoff and A. J. McQueeny, *New England J. Med.*, 235: 451, 1946; and discussed by D. Cayer, *J. Am. M. Ass.*, 132: 558, 1946.

I esteem a habit of benignity greatly preferable to munificence. The former is peculiar to great and distinguished persons; the latter belongs to flatterers of the people, who tickle the levity of the multitude with a kind of pleasure.—Cicero.

THE TREATMENT OF URETHRITIS*

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THE advent of the various sulfonamide preparations within the past fifteen years and the more recent development and clinical application of penicillin has greatly modified the treatment of many infections. The therapy of *N. gonococcus* infections, however, has probably been influenced as much as, if not more than, any other individual specific disease by the new therapeutic agents. Moreover, during the war years, attention has been focussed on the prevention and treatment of social diseases because of the grim realities of war demanding conservation and maintenance of effective man-power. The initial successes with sulfonamides and penicillin led to optimistic and over-enthusiastic reports of spectacular results with the new preparations. Pelouze[1] in discussing this bluntly states, "Nowhere in all the fields of medicine have fact and fancy been more thoroughly and continually jumbled than in the case with gonorrhœa and its treatment".

It is the purpose of this report to describe and discuss briefly the various therapeutic measures which were employed in the treatment of urethritis among male service personnel who were admitted as patients to No. 1 Canadian Special Hospital Overseas. It is impossible to dogmatically propound any hard and fast routine procedure to be followed. Now, as in the past, the clinician must adapt, modify or alter the treatment according to the response and peculiarities of the individual. Furthermore, the clinician's responsibility does not end when the patient is rendered asymptomatic. Repeated cultures and examinations, even after the patient has been apparently cured, are a necessity in every case. Our experience with thousands of urethritic cases has convinced us that careful study and management of each individual case are necessary. We found, also, in spite of many opinions to the contrary, that the discriminating use of local therapy was beneficial in many resistant cases. The occurrence of a post-gonorrhœal discharge is a disturbing factor in a fair percentage of cases. When such a discharge persists beyond a few days, active treatment must be undertaken. In our experience the residual urethritis was a troublesome sequel to gonorrhœa. It certainly cannot be dismissed as a harmless catarrhal condition not worthy of consideration.

* Read at the Sixty-sixth Annual Meeting of the Ontario Medical Association, May 23, 1946, Toronto, Canada.

TREATMENT OF GONORRHŒAL URETHRITIS

Repeated intramuscular injection of penicillin in sterile distilled water or isotonic sodium chloride solution in adequate doses over a sufficient period, is the accepted treatment for gonorrhœal urethritis. The solution is usually made in strength of 5,000 units per c.c. Optimal results are obtained by injecting a total of 120,000 to 150,000 units in equal divided doses at three hour intervals for a total of eight doses. The continuous intravenous administration of more dilute penicillin solution, although more desirable because it maintains a more constant blood level of penicillin, is not practical for routine use.

The studies of Romansky and Rittman[5, 6, 7] as well as Van Slyke and Heller[8] would indicate that the single injection of calcium penicillin suspended in peanut oil and beeswax offers decided advantages over the repeated injections of the saline preparation and is as therapeutically efficient. We have had no experience with this preparation which will undoubtedly modify and simplify the procedure of penicillin therapy in gonorrhœal infections.

Previous to and immediately following penicillin administration, the patient's fluid intake should be reduced to the practical minimum to delay the elimination of the drug. He should be enjoined to limit his physical activities until the acute phase of the infection has subsided. Hot sitz-baths taken once or twice daily are beneficial. Total abstinence must of course be enforced, not only during this stage but until the patient is pronounced cured. Local treatment such as irrigations, instillations or injections probably cause more harm than good in the very acute stage of urethritis and are definitely contra-indicated at this stage of the infection. The patient should be instructed to inspect the urethral meatus each morning and to report any changes in the quality and character of the discharge. A smear of the urethral discharge and a specimen of the first urine voided should be collected and inspected daily. Vigorous stripping and milking of the urethra is a common practice in apprehensive patients and it is essential to warn all patients against this performance. Immediately following penicillin therapy, there is a marked diminution or cessation of urethral discharge: 50 to 60% of

cases have a cessation of discharge or, at the most, a persistance of mucoid discharge which gradually disappears within four or five days. A further 15% have mucoid discharge, persisting for ten days or longer, in sufficient amount to cause concern to the patient. Microscopic examination of the stained smear of the early-morning urethral discharge in these cases will reveal a great deal of mucus with comparatively few cellular elements present. About 22% of patients exhibit a persistent, post-gonorrhœal discharge due to residual urethritis. The discharge is, as a rule, scanty and usually thin and watery, rarely thick and mucoid. Microscopically, there is a predominance of cellular elements over mucus in the smear of the discharge. A study of the flora of urethral discharges before treatment in gonorrhœal urethritis often shows the presence of concomitant invading organisms with the *N. gonococcus.*

Singman[9] investigated the flora of urethral discharges in 200 consecutive cases of gonorrhœal urethritis. In 26 cases organisms were isolated which were insensitive to both penicillin and sulfonamide *in vitro.* In these cases similar organisms were isolated from the post-gonorrhœal discharge. The future history of this group is interesting: 2 cases cleared up without further treatment; 4 cases had marked prostatic infection and responded satisfactorily to combined chemotherapy and prostatic massage; 20 proved refractory to the usual therapeutic measures. These were finally subjected to non-specific fever therapy with satisfactory results except in one case. It is obvious that organisms, which are non-susceptible to penicillin, are capable of maintaining an inflammation of the urethra after the *N. gonococcus* has been effectively disposed of by penicillin therapy. It is this residual urethritis, occurring in about 23% of cases, which is the treatment-problem in gonorrhœal urethritis of the present-day clinician. It may prove exceedingly refractory to treatment and is the source of dispute and criticism of the effectiveness of penicillin in the treatment of urethritis.

It is important that the patient be examined frequently after treatment. Daily smears of the urethral discharge are desirable and repeated cultures of the discharge are indicated if it is purulent. The persistence or the reappearance of the gonococcus obviously demands further penicillin therapy. It is recommended that the repeat treatment be carried out over a 48-hour period in order to maintain the blood level of penicillin over a longer period. If, on the sixth or seventh day after treatment, the patient is without urethral discharge, or, if there is only a slight mucoid discharge with very few pus cells present, a culture of the prostatic fluid of the patient should be made. Objection is frequently made to early prostatic massage on the grounds that it stirs up infection in the gland. We have caried out prostatic massage at this stage in thousands of cases without harmful results. If infection does persist the procedure serves as a provocative and detects failures of penicillin treatment at an early and opportune time when further therapy can be easily instituted. It is obvious that the massage of the gland should be nothing more than a gentle stripping to express sufficient fluid for the examination.

Relapses immediately following treatment, or failure of the *N. gonococcus* to disappear from the urethral discharge after the initial treatment, can be expected in 3 to 6% of cases. As stated above, the obvious remedy is more intensive penicillin therapy with further microscopic and cultural studies of the urethral discharge. I have never known the *N. gonococcus* fail to eventually disappear when intensive penicillin therapy was effected.

TABLE I.

PENICILLIN THERAPY IN GONORRHŒAL URETHRITIS

	No. of cases	*Percentage*
Total	684	100
Cases dry within 6 days	425	62.13
Cases with persistent mucoid discharge	105	15.35
Cases with purulent discharge	154	22.35
Cases with prostatitis	51	7.4
Cases requiring non-specific fever therapy	61	8.7
One series of injections	17	
Two series of injections	12	
Three series of injections	32	
Relapses		3.37%
Average days in hospital after penicillin therapy		6.9

TREATMENT OF RESIDUAL URETHRITIS AND NON-SPECIFIC URETHRITIS

The treatment of urethritis is not a routine matter. Success in therapy is more dependent on careful study and observation of the individual case, and the application of appropriate therapy by the clinician, than the adoption of a stereotyped course of treatment. Individuals show wide variation in their reaction to a particular treatment or drug.

Any local anatomical condition which might interfere with the proper drainage of the urethra such as phimosis or pin-hole meatus should be corrected. Usually the discharge is thin and mucoid but occasionally a very florid type of residual, non-specific inflammation of the urethra is encountered. In these very acute infections, it goes without saying, any local measures, beyond mere palliative procedures to promote drainage, are definitely contra-indicated.

General treatment.—For the most part, the importance of general treatment measures is not sufficiently stressed. Urethritis will often improve or subside completely on rest alone, a fact which should never be lost sight of in the treatment of refractory cases. In civilian life, cases are, of necessity, treated on an ambulatory basis and some compromise between activity and complete rest is obligatory. Nevertheless, the patient should understand that his co-operation is essential. He should be urged to limit his physical activities to the minimum. Alcohol and sexual excitement of any kind are, of course, strictly prohibited. The fluid intake should be increased to approximately 3,000 c.c. for the 24-hour period. Hot sitz baths once or twice a day are decidedly helpful. There is no particular benefit in excluding tea, coffee or other non-alcoholic beverages from the diet. The wearing of suspensories, athletic supports, or the use of sanitary bags is usually unnecessary.

Chemotherapy with sulfonamide drugs.—The sulfonamide preparations are of definite benefit in the treatment of non-specific inflammation of the lower genito-urinary tract. The great majority of cases (75 to 90%) will be symptomatically cured by the use of a sulfonamide preparation in appropriate dosage. Of those cases not cured, there are only a few that will not be somewhat improved following their administration. Our experience led us to favour short, intensive courses of the less toxic sulfonamide drugs. Commonly 20 gm. of sulfathiazole or sulfadiazine were given daily for two-day periods without difficulty. Reactions were uncommon: in one series of 146 cases only one minor skin reaction with sulfadiazine was encountered. Adequate alkalization of the urine and sufficient fluid intake were regarded as essential features of the treatment.

Treatment with penicillin.—The indiscriminate administration of penicillin to all cases of urethritis is not to be recommended. As could be expected, the drug is ineffective in most cases of post-gonorrhœal urethritis. The causative organisms have already shown their resistance to penicillin by surviving the treatment which was bactericidal to the gonococci. In non-specific urethritis, the percentage of cases due to infection with penicillin-resistant organisms is large. Under active service conditions, attempts were made to treat all cases of urethritis by the early intravenous administration of penicillin. The results were disappointing. On the other hand, in selected cases of urethritis, where an infecting organism has been identified as penicillin-sensitive, early penicillin therapy is of course clearly indicated.

Streptomycin in the hands of Aberhart[10] and others has proved effective in the treatment of cystitis due to a large group of Gram-negative organisms. When it is commercially available, it will probably be a valuable therapeutic agent in the treatment of non-specific urethritis.

Local treatment. — Penicillin therapy and chemotherapy have rendered almost obsolete many of the messy, laborious urological procedures of a decade ago. However, these methods must have had some virtues since urethritis was successfully treated even in that period. It is well to bear them in mind as some of them can often be usefully employed as adjuncts to our more modern therapeutic program. Now, as ten years ago, local treatment is emphatically contra-indicated in the florid acute stage of any urethritis. Local treatment measures are most useful in the treatment of cases which have entered a subacute or chronic phase. The use of the utmost care and gentleness is a prime requisite when employing any local urethral treatment.

(*a*) *Irrigation.*—We have found potassium permanganate solution in strength not above 1:5,000 and preferably approximately 1:8,000 to be an admirable fluid for irrigation of the anterior urethra in acute urethritis. Mucus and pus adhering to the mucous membrane are washed away and the mild astringent action of the solution is soothing and beneficial to the inflamed urethral lining membrane. Urethral irrigations are done once or twice a day.

(*b*) *Injection.*—The local irritation of the inflamed anterior urethra is often markedly alleviated by the injection into the canal of solutions of the organic silver salts. The introduction of the medication is accomplished by means of a glass syringe with a rubber bulb ejector. The patient should urinate before each injection to cleanse his urethra of as much exudate as possible. Ordinarily, 10 to 15 c.c. of drug is sufficient at each injection, and the patient should be instructed not to attempt to force the fluid too far into the urethra. The medication is retained by the patient compressing the lips of the meatus together for about five minutes and is then allowed to run out.

(*c*) *Instillation.*—Instillation is a term used in urological practice to specify the introduction

of medication into the posterior urethra by means of a rigid cannula, or a flexible gum elastic catheter. The instillation of organic silver salts, or of weak silver nitrate solution, can often be used to advantage in the treatment of posterior urethritis and prostatitis.

(*d*) *Instrumentation.*—Instruments are introduced into the urethra for either diagnostic or therapeutic purposes and occasionally as a provocative measure. The urethroscopic picture of non-specific inflammation is a fairly constant one of inflammation of Littré's glands. Ordinarily, the information gained from urethroscopy is limited and generally the examination should be left to the specialist to carry out. Air distension of the urethra can result in severe reaction and it is not generally realized that fatalities have occurred following this examination. Exploration of the anterior urethra for stricture or for areas of induration can be satisfactorily and properly made by using the bougie à boule or the rigid, acorn-tipped sound. The location, extent, character and calibre of any constriction can be determined by the characteristic "hang" felt when the appropriate-sized sound or bougie is passed. The ordinary curved steel sound is useless in the diagnosis of stricture.

Massage of the anterior urethra is, in our experience, a useful therapeutic procedure in cases of urethritis which have lapsed into a resistant, subacute or chronic state. At this stage, the infection is sustained in the glands of Littré. Gentle massage of the urethra against an F20 or 22 calibre sound, which has been gently introduced into the anterior urethra, empties these glands of their secretions and promotes drainage. Clinically, massage of the urethra in suitable cases is followed by diminution or cessation of urethral discharge. It should not be done in cases with profuse discharge or in cases with a high proportion of pus cells in the urethral smear. Criticism may be made to the passage of instruments on the grounds that it traumatizes the urethra and is likely to be followed by stricture formation, but that is not our experience. Judicious massage of the glandular structure of the subacute or chronically-inflamed urethra, is as therapeutically sound a procedure as prostatic massage, and when properly carried out, equally effective.

(*e*) *Pyretotherapy.*—The use of non-specific fever therapy in the treatment of residual urethritis and non-specific urethritis would probably have a limited field of application in ambulatory civilian cases. However, it proved to be a valuable adjunct in expediting the clinical cure and minimizing the period of ineffectiveness amongst service personnel overseas. It was employed only in cases resistant to a fair trial of other methods of treatment. Patients subjected to fever were carefully examined and especially prepared. A history of asthma, hay fever or serum reaction was considered a definite contra-indication. A sensitivity test was carried out on each candidate by injecting ¼ c.c. of 50 million per c.c. strength T.A.B. solution intradermally on the volar aspect of the forearm. Untoward sensitivity to the preparation is indicated by the appearance of an area of reaction of more than 1 c.c. diameter within a 24-hour period following the injection. Twenty-eight cases, of a series of 708, were denied fever therapy because of sensitivity as demonstrated by a positive skin reaction. Chemotherapy was carried out simultaneously with fever therapy. Over the 24-hour period preceding the initial injection, the patient received a total of 10 gm. of powdered sulfathiazole in divided doses at four-hour intervals. Four-and-a-half grams of the same drug were administered daily, during and for a few days following, the fever treatment.

The preparation used was a specially diluted form of typhoid and paratyphoid A. and B. vaccine, prepared for the War Office by the British Emergency Vaccine Laboratory. The usual concentrated form of T.A.B. vaccine used for immunization was not considered suitable for this purpose. The vaccine was available in suspensions of fifty million, one hundred and fifty million, and two hundred and fifty million bacilli per c.c. The increasing strengths were injected intravenously on successive days until a satisfactory febrile reaction resulted. The series of injections was not completed if a satisfactory response was obtained from a smaller dosage.

One death occurred in this series: a patient 35 years of age following the third injection of vaccine. There were no prodromal indications of intolerance and death occurred suddenly from cardiac failure. Autopsy revealed moderate atheromatous changes without thrombosis in the coronary arteries. This was the only fatality in a total experience of over 1,400 patients treated by pyretotherapy.

The response to fever therapy was considered satisfactory if there was an absence of any clinical signs of urethral inflammation and, as well, an absence of pus in centrifuged specimens of the first ounce of urine voided in the morning on repeated examinations. In addition, urethroscopic examination, examination of the prostate, and microscopic examination of the prostatic fluid, were required to be negative.

TABLE II

300 CASES OF RESIDUAL URETHRITIS FOLLOWING GONORRHŒAL URETHRITIS TREATED WITH NON-SPECIFIC FEVER THERAPY

Average hospitalization previous to treatment	20.75 days
Average hospitalization after treatment.....	5.98 days

	Cases	*Percentage*
Total number of cases.....	300	100.0
Failures.....	33	11.0
Immediate response.....	246	82.0
Delayed response. Favourable results 5 to 8 days.....	21	7.0

TABLE III.

380 CASES OF NON-SPECIFIC URETHRITIS TREATED WITH NON-SPECIFIC FEVER THERAPY

Average hospitalization before treatment with fever.....	9.2 days
Average hospitalization after fever.....	5.4 days

	Cases	*Percentage*
Total number of cases.....	380	100.0
Immediate response.....	323	85.29
Delayed response.....	23	5.15
Failures.....	34	8.98

FOLLOW UP TREATMENT AND TEST OF CURE

From a public health standpoint, proper surveillance with adequate test of cure, after all symptoms and signs have disappeared, is the most important phase of treatment. Gonorrhœa would be a rare disease if every asymptomatic case were actually cured. Koch *et al.*,[15] on a cultural study of asymptomatic sulfonamide treated cases, found 41.7% apparently cured cases to have *N. gonococci* persisting in the lower genito-urinary tract. After initial penicillin therapy, we found 3.6% of our cases similarly to harbour *N. gonococci.*

To assume that a patient is cured the following criteria should be met. (1) The patient should be free of urethral discharge and other local signs of inflammation. (2) The first voided urine in the morning should be microscopically free of pus cells. (3) Culture of the prostatic fluid should be negative for *N. gonococcus.* (4) The anterior urethra should be explored with an acorn-tipped sound. Tests of cure as outlined above should be carried out monthly for a three-month period.

Cases of non-specific urethritis should be subjected to the same surveillance. It is well to realize that, in most cases of non-specific urethritis, the primary causes of the condition are not influenced. Treatment, therefore, is usually empirical and recurrence beyond the control of the usual therapy.

CONCLUSIONS

1. Penicillin therapy is indicated in all cases of urethritis due to *N. gonococcus.*

2. Approximately 35 to 40% of cases of gonorrhœal urethritis have a post-gonorrhœal discharge following penicillin therapy.

3. In approximately 22% of cases there is a residual urethritis demanding further treatment.

4. Sulfonamide administration with local treatment is followed by a cessation of discharge in approximately 50 to 60% of cases of residual urethritis.

5. Pyretotherapy has proved a useful adjunct in the treatment of resistant cases of urethritis.

6. Urethral irrigation, injection, instillation and instrumentation still have their useful place as adjuncts in the local treatment of resistant urethritis.

7. Penicillin therapy is of limited value in the treatment of non-specific urethritis. Its use should be reserved for selected cases.

8. Cultures of urethral discharge and prostatic fluid for *N. gonococcus* should be carried out as a routine procedure.

The material for this report was drawn from the records of No. 1 Canadian Special Hospital Overseas.

Appreciation is expressed to Major M. Wallace, H. Hymen, and Howard Ellis. The bacterial studies were carried out by Lieut. R. Singman.

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Precious little our fathers knew,
Precious little, when all is said,
Most of their teachings were quite untrue,
Most of their remedies cured your dead.
But down from the heavens or up from the mould,
Send up the hearts of our fathers of old.

Dr. Joseph C. Doane, *The Diplomate*, **12**: 17, 1940.

RECENT ADVANCES IN PENTOTHAL ANÆSTHESIA*

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SINCE its introduction in 1934 sodium ethyl thiobarbiturate or pentothal, as it is commonly called, has attained increasing acceptance on the part of the surgeon and the anæsthetist. It has displaced the other anæsthetic measures by approximately 50% and in the past ten years has shown a high annual percentage throughout. From the Mayo Clinic the following table is indicative of its general acceptance:

INTRAVENOUS ANÆSTHESIA WITH PENTOTHAL SODIUM—1945

	Cases 1945	*Total cases* 1934 *to* 1945
Operations on brain, spinal cord and peripheral nerve	185	3,891
Operations on eye	194	1,306
Operations on head and neck (other than above)	1,682	9,895
Dental extractions	25	269
Urologic operations	1,708	14,191
Orthopædic operations	1,354	8,060
Operations on thorax, thoracic wall, breast and axilla	593	5,291
Intra-abdominal operations	466	6,232
Operations on abdominal wall and for hernia	193	1,562
Gynæcologic operations	1,156	10,120
Operations on anus	44	545
Total	7,600	61,362

An analysis of these figures shows the various surgical conditions for which pentothal is now considered most suitable. A scheme of the uses of pentothal at the present time will serve to illustrate the ever-growing field in which this agent is being employed.

OUTLINE OF USES OF PENTOTHAL SODIUM AS AN ANÆSTHETIC AND ANALGESIC AGENT (AFTER LUNDY[2])

I. Indirect with pentothal followed by maintenance with other forms of anæsthesia.
   A. Regional anæsthesia.—To avoid pain during injection of local anæsthesia.
   B. Inhalation anæsthesia. (1) To avoid distress of induction of general anæsthetic by inhalation. (2) For patients who have hypertension. (3) Resistant patients.

II. Pentothal used for maintenance of anæsthesia.
   A. Used alone for operations. (1) Minor operations in or out of hospital; (2) on epileptics; (3) on psychotics; (4) major operations.
   B. Combined with inhalation anæsthetic and O_2 for maintenance in major and minor operations. (1) To shorten period of rebreathing in presence of high fever or heat prostration. (2) Because of lack of, or insufficient preoperative medication. (3) Because of marked debility (low hæmoglobin, senility, recent marked loss of weight). (4) Because of marked respiratory depression owing to marked effect from preliminary medication.
   C. Intentionally combined with local, spinal or rectal anæsthetic.
   D. Complementary maintenance with pentothal because of: (1) Inadequate anæsthesia. (2) Complementary during operation or anæsthetic because of: (*a*) nausea, tremor, sneezing, coughing or hiccupping; (*b*) fire hazard; (*c*) convulsions associated with local anæsthetics; (*d*) convulsions associated with general anæsthetics; (*e*) epistaxis; (*f*) acute hypertension associated with inhalation anæsthesia.

III. Intravenous anæsthesia in obstetrics.
   A. For abdominal Cæsarean section.
   B. For operative obstetrics other than Cæsarean.
   C. For non-operative obstetrics.

IV. Non-surgical uses of pentothal.
   A. For preoperative prediction of effects of neurosurgical treatment of hypertension (Smithwick).
   B. For treatment of psychosis.
   C. For other non-surgical uses: (1) pain; (2) restlessness; (3) asthma; (4) medico-legal purposes; (5) migraine (occasionally); (6) tetanus; (7) status epilepticus.

STAGES OF PENTOTHAL ANÆSTHESIA

Until recently no effort has been made to classify the various stages and planes of pentothal anæsthesia. It was generally considered that the transition from one stage to another was too rapid and the signs too inconsistent and diversified to permit schematizing. However, since weaker solutions of the drug are being more generally used it has become evident that there are definite stages of anæsthesia with pentothal comparable to the stages of ether and other volatile anæsthetics. The recognition of these phases will render pentothal definitely more controllable and accordingly should add to its safety.

In recent and as yet unpublished work Etsten[3] based a classification of the stages of pentothal anæsthesia on the physiological action of the drug on the brain. The cerebral metabolic rate was determined by evaluating the difference in the O_2 content between the arterial cerebral flow and the venous return, *i.e.*, the metabolic rate. Neuro-anatomical allocation was made by the variation in the metabolic rate of the various parts of the brain. Patients were subjected to various depths of anæsthesia using a 1% pentothal solution in order to obtain the different stages more slowly. The various phases of anæsthesia were correlated with the neuro-anatomic allocation with the following classification:—

STAGE I.

Clouded consciousness.—The patient becomes euphoric; movements become inaccurate; there

* Read before the Section of Anæsthesia of the Ontario Medical Association on May 23, 1946.

is a complete loss of apprehension associated with a feeling of relaxation. In this stage the cerebral metabolic rate of the cortex is depressed.

STAGE II.

Hypersensitivity.—In this stage there is loss of consciousness. If the patient has been counting aloud, this terminates. He has lost environmental contact. The neuroanatomic allocation is that the subcortical areas, particularly the thalamus, the hypothalamus and the subcortical nuclei, are now in control, with the thalamus the receptor of all painful stimuli. If the patient at this point is subjected to a painful stimulus he will respond by exaggerated movements and voluntary muscular activity of the extremities. The reason for this is that cortical control has been removed from the thalamus. Immediately the painful stimulus has been withdrawn, the patient regains his former tranquil state. This is in marked contrast to ether, under which at a similar stage an excitement phase would be provoked. The hypothalamus which controls both the sympathetic and the parasympathetic nervous systems is now somewhat depressed because pentothal has a special affinity for the hypothalamus. This explains the respiratory depression so frequently occurring at this stage.

The signs of this stage are a contracting but unfixed pupil. Eyeball activity becomes involuntary and roving in character. The corneal reflex may be present or absent. Blood pressure, pulse and respiratory rates are within normal limits.

STAGE III.

Surgical anæsthesia. — This stage is divided into three planes.

Plane I, light surgical anæsthesia.—The thalamus is depressed and the reaction to painful stimuli is minimal, evidenced only by a slight movement of the leg or arm. The pupils are constricted but the eyeballs are eccentrically placed. The pupils still contract with light and dilate with pain. There is still no change in blood pressure, pulse or respiration.

Plane II, moderate surgical anæsthesia.—A painful stimulus no longer elicits any muscular response. The thalamus, the hypothalamus and subcortical nuclei are all functionally depressed. The pupils are constricted and will not further contract to light although they will still dilate with pain. The eyeballs are concentrically placed. Respiratory amplitude is diminished. There is a respiratory response to a painful stimulus evidenced by either a short period of apnœa or an increased respiratory rate. The midbrain is now the highest remaining functioning level even though it is slightly depressed.

Plane III, deep surgical anæsthesia. — The midbrain is now depressed and the pain centres situated there are no longer affected. The pupils do not react to light or pain. The respiratory rate is increased but the amplitude is diminished. The pulse rate is increased and there is a slight fall in blood pressure.

STAGE IV.

Impending failure.—Now the only remaining functioning part of the brain is the pons and the medulla. Respirations are markedly depressed with resulting anoxia. The pupils dilate. The pulse becomes fast and thready and there is a marked fall in blood pressure.

COMMENTS

Apart from the primary respiratory inhibition associated with the second stage, the respiratory depression throughout the course of the anæsthetic coincides with the depth of the anæsthesia. The clinical significance of this is readily apparent.

These observations were made with 1% pentothal on non-premedicated patients without operation. It is logical to assume that with greater concentrations of the drug, the stages will overlap and tend to merge more rapidly. Such additional factors as pre-medication and varying degree of surgical shock will create conditions divergent from those existing in this series with altered results. But this is a stimulating effort to analyze and thus render more controllable the stages of pentothal anæsthesia.

RECTAL PENTOTHAL

Weinstein[4, 5] reports 2,500 cases in which pentothal was used as a basal anæsthetic. In this series there were no deaths or serious complications which could be attributed to the anæsthetic. The untoward reactions sometimes experienced with the drug when administered by the intravenous route have not been experienced with pentothal given by rectum. There is no respiratory depression, no fall in blood pressure and the recovery period is rapid. There is the same synergistic action with cyclopropane and nitrous oxide-O_2 and it is most effective as a preliminary to spinal anæsthesia.

Intravenous pentothal can be used following the rectal injection in much smaller dosage than would be required with other basal anæsthetics or preliminary medication.

The dosage consists of 1 gm. pentothal for every 50 pounds of body weight. The total amount is dissolved in 1 to 1½ ounces of distilled water. The water may be warmed but this is not necessary. No preliminary enema is given but if one is ordered for any reason, it should be given several hours before and only plain water or saline should be used. Soapsuds interfere with the absorption of pentothal. Children tolerate the drug as well as adults when given by this route and full dosage should be employed with them. For asthenic, overweight, anæmic, or senile patients however, the dosage should be reduced by 10%. Atropine in full dosage without morphine should be given one-half hour prior to its administration. The rectal instillation is made with a 50 c.c. syringe attached to a small catheter or with a funnel and catheter. It is well to run a small amount of plain distilled water through the tubing at the conclusion to ensure the patient receiving the full dose. The patient should not be disturbed subsequent to the injection. Usually in 5 to 10 minutes the patient is sleeping soundly and can be moved to the operating room without being roused. The usual duration of the sleep is 1 to 1½ hours with a more gradual recovery than when intravenous pentothal is used.

Precautions

A clear air-way must be maintained. If the anæsthetist is not present for the administration, the attendant nurse must be definitely instructed in this regard. Keeping the chin well forward is usually all that is required and the attempted insertion of an air-way will usually result in coughing and gagging. We have had no cases of undue depression but should such occur O_2 administration and coramine, picrotoxin or metrazol intravenously would be indicated.

Case History

A child, aged 6 years, was admitted with a diagnosis of acute appendicitis. She had been acutely ill with measles for 5 days. Her temperature was 105° and she was coughing persistently. Coarse râles, suggestive of bronchopneumonia were heard over the chest anteriorly and posteriorly. We were hesitant to administer an inhalation anæsthesia under these conditions. It was decided to use rectal pentothal plus local infiltration. She was given 1 gm. pentothal in 1 ounce of distilled water. In 6 minutes she was sleeping quietly. Local infiltration with 0.5% novocain was employed thereafter. She reacted very slightly to the original insertion of the needle but did not cry out nor was there any further protest. On return to the ward she reacted slightly to supraorbital pressure and to painful stimuli of intravenous and intramuscular needles. Despite a somewhat stormy course during the next 3 days the child went on to uneventful recovery.

The Widening Scope of Pentothal

Pentothal is an ultra-rapid barbiturate in contradistinction to the rapid (*e.g.*, nembutal) and slow (*e.g.*, phenobarbital). Its method of excretion is as yet not definitely understood. It was formerly believed that like other barbiturates it was detoxified in the liver and excreted through the kidneys. Masson and Beland[6] have disproved this in their recent work and conclude that all the cells of the organism participate in the process. Patients whose liver function has been almost completely destroyed tolerate pentothal as well as the normal individual and jaundice is no longer considered a contraindication to its use. In genito-urinary work also its scope has become much wider and pentothal is being safely used for prostatectomy, suprapubic drainage, perineal drainage, etc., in cases in which there is marked impairment of the renal function. As these former contraindications were the basis for the restriction of the use of pentothal in the older age group, it is now considered as safe to use pentothal with them as any other anæsthetic agent. There must, of course, be a full appreciation of the hazards associated with the administration of any anæsthetic in this group.

Carotid Sinus Stimulation

That pentothal is contraindicated in even short surgical procedures about the mouth, throat and nose, is now generally accepted. The hazard is apparently due to carotid sinus stimulation. Situated at the bifurcation of the carotid artery is a collection of stretch receptor nerve endings exerting a continual inhibitory effect on the respiratory centre through the glossopharyngeal nerve. It is sensitive to mechanical stimulus. In close proximity to it, is the carotid body. Its fibres also act through the glossopharyngeal nerve but is subject to chemo-stimulation; *i.e.*, variations in CO_2 and O_2 tension.

The carotid sinus is supplied by only one small artery. This fact is considered responsible for the lag in the anæsthetic effect of pentothal on the sinus as compared to the rest of the nervous system. This comparative hypersensitivity decreases during the course of the anæsthetic but should pressure be exerted on the sinus, or the fibres be stimulated reflexly before

the lag is overcome, temporary or permanent respiratory failure with a marked fall in blood pressure may result. Some of the mishaps previously attributed to overdosage of pentothal are now ascribed to carotid sinus stimulation.

Probably the safest way to avert such catastrophies is to avoid the use of pentothal for surgery in the areas in which the carotid sinus might be stimulated either directly or reflexly. If it is used, there should be an interval of 5 minutes allowed to elapse from the time the patient is anæsthetized until the operation is commenced. This, of course, is to overcome the lag period of the carotid sinus.

An anæsthetic aphorism is; "The best anæsthetic is only as good as its worst administrator". The apparent simplicity of administration and technique is the greatest pitfall connected with pentothal and is responsible for mishaps which tend to condemn the drug unjustly. This was the case with its use in the American armed forces earlier in the war and for a considerable period led to the restriction of its use. The Americans claimed that there was five times the mortality with pentothal than there was with any other anæsthetic agent. This situation adjusted itself with the further recognition of the drug's limitations and with more intensive instruction in its use. Every anæsthetist who uses the drug at all extensively will develop his own peculiar routine. However, there are certain "don'ts" which should be observed and which I submit without apology.

1. Don't induce rapidly. Weaker solutions given slowly will reduce or eliminate the primary respiratory depression.

2. Don't use strong solutions. The results from inadvertent extravenous administration are much less severe with weak solutions.

3. Don't exceed 1.5 to 2 gm. pentothal. In prolonged cases use balanced anæsthesia.

4. Don't use pentothal alone if muscular relaxation is required.

5. Don't use it for children. They tolerate barbiturates intravenously poorly. This does not pertain to rectal pentothal.

6. Don't use it for nose and throat work.

7. Don't use it unless O_2 is available in case of mishap. This will usually rule out office use in which subsequent muscular inco-ordination is another factor.

8. Don't hurry reinforcing injection or exceed small amounts in an effort to offset light anæsthesia quickly, or to overcome coughing, twitching or laryngo-spasm.

9. Don't use an air-way routinely. It will often excite a cough reflex and interrupt an otherwise satisfactory anæsthetic. Usually keeping the jaw forward is all that is necessary.

10. Don't use it for transpleural work.

11. Don't use it without preliminary atropine. If atropine has been omitted prior to the operation, give it intravenously before the pentothal.

12. Don't use it for a bronchoscopic before you have used it to incise a finger.

CONCLUSION

The essentials of an ideal intravenous anæsthetic might be defined as: (1) potency; (2) low toxicity; (3) wide margin of safety between the anæsthetic and toxic dose; (4) good muscular relaxation; (5) rapid elimination with prompt recovery period.

Such an ideal has not yet been attained, but pentothal fulfills these postulates more closely than any other that has as yet been evolved. We expect another barbiturate for intravenous use will soon be available, but I do not think its superiority is such that it will displace pentothal. The impetus given intravenous anæsthesia by the war is giving rise to more intensive investigation which should result in further progress in this field. Its limitations must be recognized, and a due respect for its hazards maintained. Used with this in mind, pentothal will, I believe, play an increasing rôle in the armamentarium of the present day anæsthetist.

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Neurosurgeon, after 6 hours of a craniotomy, "Sister, where's the clock?"

Theatre sister, "It's gone for repair, sir."

Anæsthetist, fairly *sotto voce*, "I shouldn't bother, Sister, stick up a calendar instead.—"In England Now", *The Lancet*, November 2, 1946.

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CASE REPORTS

NEUROLOGICAL AND PLASTIC REPAIR OF CRANIAL AND DURAL DEFECT*

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The plastic repair of extensive cranial defects has become a routine surgical procedure in the recent war years and various methods have been employed. One of the techniques most commonly used has been the closure of defects with tantalum plates. We do not propose to review this subject, which has already been described in detail by various authors.[1 to 5] However, in certain very serious skull defects which include extensive loss of the scalp, calvarium and even of the underlying dura, the problem of plastic repair becomes much more complicated. This is particularly true when massive infection and necrosis of bone are present.

The following case is described because it presented many of the difficulties that confront the plastic surgeon and the neurosurgeon in coping with these unusual problems. In this instance the patient suffered a severe electrical burn of the head which caused extensive loss of the scalp with underlying bone necrosis and infection. There was complete loss of the dura covering the brain in the region of the burned area with the formation of a very large, foul smelling abscess which lay between the necrotic bone and the pia arachnoid. The area of the defect measured six inches in diameter. Reconstruction of this defect required the insertion of a graft to replace the dura, the provision of a rigid support for the area of destroyed skull, and finally, a substitute for the burned scalp.

CASE REPORT

The patient, a man of 35, was repairing a power line carrying high voltage current on July 15, 1942, when the accident occurred. His head touched a high voltage wire and the current was short-circuited between his skull and his right foot which was resting against the transformer. He was thrown to the ground in an unconscious condition and required artificial respiration.

Physical Examination.—On admission from another hospital the day after his accident the patient was in a semi-comatose condition, restless and at times irrational. Subsequently, he was found to have a right hemiplegia, right homonymous hemianopsia and some aphasia. On the third day after the accident the optic discs were reported as blurred, signifying early papillœdema. On the sixth day the papillœdema was well established and retinal hæmorrhages were noted in the left eye. At this time the patient developed a high fever and a marked increase of cerebrospinal fluid pressure which continued for several weeks. He was suspected of having meningitis. Eleven days after his accident, the patient was found to have a positive blood culture for *Staph. pyogenes aureus*. In the left parietal region there was a circular area of scalp about two inches in diameter which was charred down to the periosteum. The right foot and lower leg extending to about the middle of the calf was severely burned, with charring of the skin and deep tissues (Figs. 1 and 2). The foot was swollen, cold and no pulsations were noted in the posterior tibial or dorsalis pedis arteries.

Figs. 1 and 2.—Extensive gangrene of the right foot and necrosis of the scalp and cranium following a severe electrical burn.

Stage No. 1—Stokes-Gritti amputation of the right leg.—One month after admission an amputation was performed on the right leg by Dr. A. L. Wilkie. The wound healed without complications.

Two months after the accident the patient's vision had so deteriorated that he could barely distinguish light from darkness. Also at this time the necrotic area in the left parietal region had extended in size until it measured four inches in diameter. The skull was exposed and it was dead white in colour except for a central charred area. Two and one-half months after the accident it was felt that infection had developed beneath the area of exposed skull and at this time a craniectomy was performed.

Stage No. 2—Craniectomy for osteomyelitis of the skull: plastic repair of dura with fascial graft.—The scalp and periosteum had been destroyed over a large, circular area of the parietal bone which was about five inches in diameter. A week preceding operation the exposed bone had turned from white to a dusky colour, with a central portion which was turning black and emitted a foul odour. It was difficult to determine whether the calvarium was involved in an infective process throughout its full thickness or whether merely the outer table was involved. Previously, it had appeared that the inner table might be intact and vascularized. Therefore, a hole was drilled with a burr into the necrotic bone. As it perforated the inner table there was an abundant discharge of thick pus issuing from beneath the bone, presumably representing an epidural abscess (Fig. 3). It was hoped to learn by this method whether the dura was intact. The opening was then temporarily plugged and the scalp and bone prepared for operation. The scalp edge which surrounded the area of necrosis was retracted and this immediately exposed healthy bone. The skin was incised in four places to facilitate the placing of burr holes about the periphery. The burr holes about the area of necrosis were joined with the Gigli saw, although two were united by rongeuring. The area of necrosis extended over the median longitudinal sinus. The large area of bone was then elevated and removed. This opened some bleeders over the median longitudinal sinus which were covered with packs and later on portions of muscle and fascia. On elevating the bone it was found that the dura was destroyed over a circular area about four inches in diameter. The brain could be seen through a more or less transparent membrane which was probably thickened arachnoid. This membrane dipped in along the furrows of the convolutions which were

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shallow and the curving cerebellar arteries could be seen through this semi-translucent membrane. The cortex appeared to be dusky yellow in colour. Therefore, the abscess was situated between the arachnoid and the skull.

For various reasons the following procedure was adopted. A fascial graft taken from the right leg was placed over the dural defect. It was held in position with a few, fine, chrome wire sutures which were passed through the fascia and through the outer layer of dura only. Before this graft was applied a considerable amount of irrigation was carried out. It may be added that the brain was under slightly increased pressure. It was also interesting to note that the normal dura ceased abruptly, exposing the pathologically thickened arachnoidal membrane through which one could see the cerebral tissue. It was as though the dura had been excised in a circular fashion. After placing the graft and controlling the venous bleeding from the median longitudinal sinus the wound was irrigated with Ringer's solution and a triple sulfonamide suspension. A few drops of the latter were injected beneath the graft. On gross examination the wound appeared to be quite clean. The skin edge was trimmed slightly. Some crystalline residue from the sulfonamide suspension was left in the wound although this was not considered essential. The wound was then packed with a layer of liquid paraffin gauze which was covered by a thick pad of saline dressings to the level of the surrounding scalp. A sheet of protective material was then applied and the whole dressing was bandaged in place with moderate pressure.

Notes on postoperative dressings.—For the first few days postoperatively the wound was left undisturbed except for changing the outer dressings. The inner packing was irrigated with triple sulfonamide solution. On the sixth postoperative day the fascial graft was found to be intact. It was adherent to the edges of the normal dura and hardly recognizable from it. The wound edges were re-packed half-way around with iodoform gauze and the other half was not changed. The outer part of the dressing was replaced with liquid paraffin and the whole area was covered with moist boric acid dressings. The wound edges were just beginning to granulate at this time and there was still a moderate amount of purulent discharge. On the tenth postoperative day the dressing was changed to balsam of Peru on gauze after irrigating with hydrogen peroxide, Dakin's solution and boric acid solution.

On the eighteenth postoperative day the outer layer of the fascia was necrosing in some areas and required superficial trimming. Healthy granulation tissue covered much of the wound which appeared cleaner (Fig. 4). Daily dressings of a similar nature were continued. By the seventh postoperative week, epithelium was spreading in from the edges of the wound over a firm, granulating surface which covered the dura and fascial graft. A small piece of bare bone was visible above the mastoid process and this was removed with a rongeur. Elsewhere there was no evidence of active osteomyelitis. Thin epithelium continued to spread over the granulating surface and the dressings were discontinued. Two small spicules of bone appeared along the edge of the scalp defect three months after operation and were removed.

Stage No. 3—Preparation of large pedicle flap from hirsute region of lower abdomen: this was attached to the left wrist and then transferred to the cranial defect. Insertion of tantalum plate to replace the loss of cranium.—Three and one-half months after the accident the patient's condition had improved to a point where it was considered that the plastic repair of the granulating wound of the head could be undertaken. A measured pedicle flap somewhat larger than the defect was outlined on the left side of the lower part of the abdomen (Fig. 5). This region was selected because it was very hirsute and thus, when the flap was transferred to the head, a less conspicuous bare area would be observed, especially when the remaining hair was combed over the defect. As a preliminary stage the flap was partially tubed and, subsequently, the proximal end was attached to the lateral aspect of the left wrist. A plaster cast was used to maintain correct relationship of the pedicle and the wrist until firm union had taken place. At suitable intervals the pedicle flap was gradually severed from the abdomen, the resultant raw areas being successively covered with dermatome skin grafts. Finally, when only a small portion of the pedicle flap remained attached to the abdomen, it was severed completely and swung up to the defect in the patient's head (Fig. 6). A very thick layer of fat was taken with the flap for the purpose of filling the deep defect and also to provide a layer of soft tissue to cover the granulating

Fig. 3.—Copious discharge of pus from an epi-arachnoidal abscess after drilling a hole through the cranium. **Fig. 4.**—Healthy granulation tissue covering the fascial graft.

dura. The distal half of the flap was sutured to the margins of the defect in the scalp which had been undermined for about one inch. The flap was sutured to the scalp with a double layer of No. 40 interrupted stainless steel wire sutures. The arm was retained in correct relationship with the head by means of a plaster cap which encircled both the head and the arm. A xeroform dressing was applied to the flap followed by a light pressure dressing. Four weeks later the pedicle was detached from the wrist, and after removing the skin graft from the undersurface of the pedicle flap, it was sutured to the margins of the remaining defect in the scalp. The pedicle flap healed by primary union in both instances.

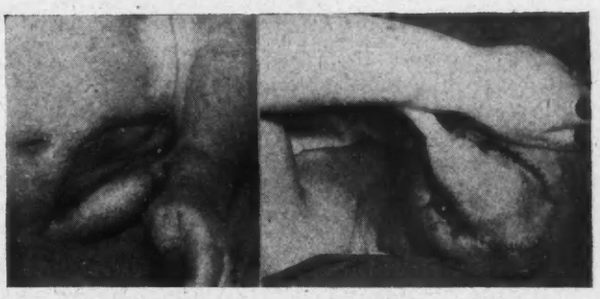

Fig. 5.—This shows the pedicle flap raised from the lower abdomen and attached to the wrist. **Fig. 6.**—At this stage the distal half of the pedicle flap has been sutured to part of the defect in the scalp.

Four months later, after an extended visit to his home, the patient returned to hospital for the insertion of a tantalum plate.

After shaving the scalp a plaster impression of the cranial defect was taken and a model was made in artificial stone. The depressed area of the defect in the model was built up with wax until the normal contour of the skull was reproduced. A second plaster impression was then taken of the margins of the defect in the

skull and the restored contour. From this impression a metal die and counter-die were made. A sheet of 0.015 inch tantalum was swaged between the dies until the correct contours had been reproduced and then the margins of the plate were trimmed and polished. The plate was perforated at regular intervals for the purpose of increasing the blood supply to the flap and also to aid in its fixation. The posterior half of the pedicle flap was incised following the scar between the flap and the scalp. The whole flap was then undermined leaving a layer of fat covering the dura. The tantalum plate which had been autoclaved was inserted beneath the skin flap (Figs. 7 and 8). The plate was wired to the periosteum in several places but the bone was not exposed because of the danger of reactivating the previous osteomyelitis. Furthermore, fixation of the plate directly to the bone would have necessitated more complete incision of the margin of the flap which would have endangered its blood supply. The wound was then closed with a double layer of No. 40 interrupted stainless steel wire sutures. A xeroform dressing was applied followed by a light pressure dressing. Primary union occurred and the patient was discharged two weeks postoperatively.

Follow-up.—Two years after the accident the cosmetic result was satisfactory (Fig. 9). The patient's mental outlook was cheerful and there was no residual aphasia or paralysis. He walked well with the aid of an artificial limb attached to the right leg. However, his visual acuity had only improved to the extent that he could distinguish light from darkness.

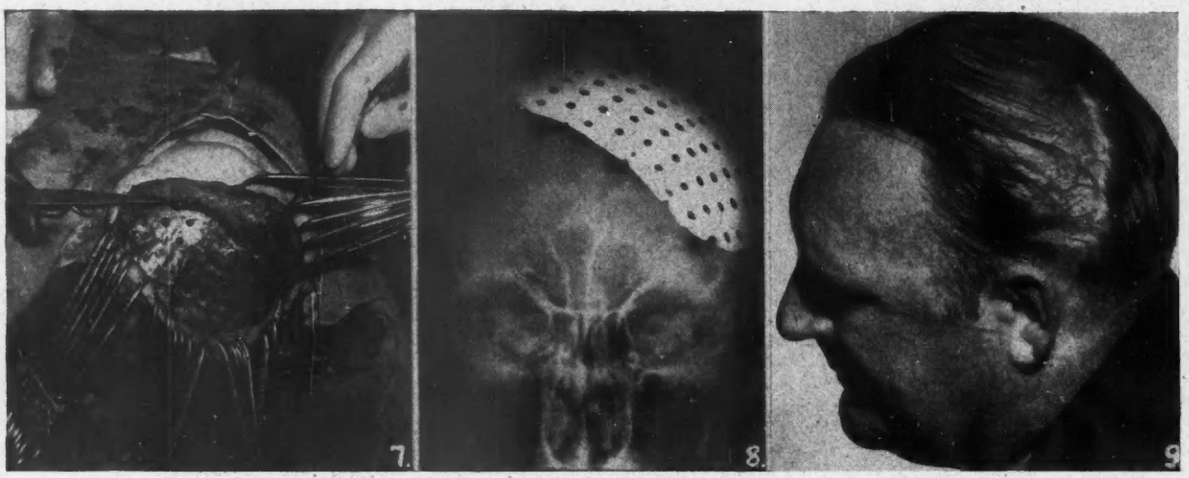

Fig. 7.—The final stage in the reconstruction was the insertion of a swaged tantalum plate to cover the defect in the cranium. **Fig. 8.**—X-ray examination of the skull two years afterwards showing the tantalum plate in position. The multiple perforations in the plate not only aid in its fixation but help to provide a more adequate blood supply to the pedicle flap above it. **Fig. 9.**—Postoperative photograph of the patient showing the cosmetic appearance of the flap which is not only covered by its own hirsute growth but is further concealed by combing the hair of the anterior part of the scalp over it.

SUMMARY

1. Experimental and clinical investigations indicate that tantalum is a satisfactory alloplastic material for the repair of cranial defects. It is non-corrosive, non-absorbent, malleable, inert in tissues and provides adequately strong support.

2. Pedicle flaps from distant regions may be required when *large* areas of the scalp as well as cranium have been destroyed. In this way distortion of the remaining scalp contours may be avoided and no further bare areas are created.

3. The use of a thick pedicle flap makes it possible to insert a tantalum plate of large dimensions beneath it without interfering with its viability or disturbing the area over which the dura has been replaced by a graft.

4. In this case it has been demonstrated that a fascial graft can be used successfully in the presence of active infection to replace an area of destroyed dura.

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VITAMIN D2 IN THE TREATMENT OF LUPUS VULGARIS*

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The treatment of lupus vulgaris has always been more or less unsatisfactory. Such measures as finsentherapy, roentgentherapy, generalized ultra-violet rays, electro-surgery, associated or not with Gerson-Sauerbruck diet and the administration of large amounts of cod liver oil, very often gave disappointing results.

Charpy[1] was the first to report the treatment of cases of lupus vulgaris with high doses of vitamin D2 (calciferol). This treatment, known as "méthode de Charpy", consists in the oral intake of 15 milligrams of vitamin D2 in an alcoholic solution. This dose is administered three times the first week, twice the following three weeks, and once a week for a period of months. A quart of milk is given daily, and 0.5 gm. of calcium twenty days each month. Other dietary measures include reduction in the salt intake, and the elimination of foods rich in fat.

The following case will demonstrate the almost spectacular results obtained with this method of treatment in an extensive case of lupus vulgaris.

Mrs. J.-F., aged 33, was first admitted to the Hôtel-Dieu Hospital, Quebec, April 24, 1945, complaining of an eruption of twenty-nine years' duration, involving almost the entire face, the left knee and the dorsal aspect of the left hand.

Familial history.—Her mother died at 28 years of age of pulmonary tuberculosis.

Past history.—At the age of 4, a small nummular lesion appeared on the forehead. This lesion increased in size at 9 years old, and large patches appeared on the left arm and the left leg. The patient was then hospitalized for a year at Laval Hospital, Quebec. During and following this hospitalization, very few lesions were in an active stage, most of them having formed scars. At 21 she had the left eye removed for an ulcerative infectious process, possibly of tuberculous nature. The skin lesions had been practically inactive, until a few months after a bilateral salpingo-ovariectomy, in 1944.

Fig. 1 Fig. 2

Fig. 1.—April 24, 1945, before treatment. **Fig. 2.**—June, 1946, after treatment, but not with vitamin D2.

The pathological report showed the presence of a hydrosalpinx, but no evidence of tuberculosis.

During the winter 1944-45, new lesions appeared on the face, the left hand and the left leg.

Physical examination.—Marked underweight. Morale very affected by the disfiguring skin lesions. The face was covered by well circumscribed, configurate, elevated and infiltrated patches, formed of coalescent nodules of red-brown colour. Many of these patches were ulcerated, purulent and covered by crusts. The infectious process was more evident at the tip of the nose, where there was a slight destruction of a portion of the alæ nasi

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(Fig. 1). Similar lesions were present on the back of the left hand. The diascopic examination showed numerous lupomas, especially at the borders of the patches. The mucous membrane of the nose was also inflamed, and the septum was perforated. There was a bilateral pre-auricular and cervical adenopathy. The third finger of the left hand was in extreme flexion on the palmar surface, on account of a destructive process of the third metacarpo-phalangeal joint (see Fig. 1). The left eye was artificial. Examination of the other organs was negative.

Laboratory data.—A biopsy specimen from the border of one of the lesions showed the histo-pathological picture of lupus vulgaris. Wassermann and urine analysis, negative. Roentgenogram, normal. Tuberculin patch test, strongly positive.

The treatment consisted of rest in bed, with a high caloric and high vitamin diet. Mapharsen was given to the extent of 0.040 gm. twice a week for ten injections. Locally, wet dressings and cod liver oil ointment were used. Later, the patient received fractional doses of x-ray, for a total of 1,250 r (135 Kv. 5 MA) filtered with 5 mm. aluminum.

The patient was discharged from the hospital August 24, 1945, four months after her admission. Her condition was only very slightly improved.

On readmission, June 17, 1946, almost a year later, the patient told us that she had been well enough for a few months. but that since January, 1946, her skin condition had become worse than ever.

Physical examination.—The lesions of the face were more inflamed, especially around the mouth and the tip of the nose. The lips were very œdematous, presenting many small ulcerations, hindering the normal movements of the mouth. The upper lip, at the edge of the nose, was deeply ulcerated and was discharging a thick yellow pus. More destruction than before was seen at the tip of the nose. The left arm was the site of a new nodular circinate patch. On the left elbow and dorsal aspect of the left hand, there were irregular shaped ulcers filled with pus (Fig. 2). On the dorsal and inner surfaces of the left knee two large patches, one of them ulcerated, were present. There was still a marked bilateral pre-auricular and cervical adenopathy. The physical examination otherwise was negative, except for underweight.

Laboratory data.—Wassermann and urine analysis, negative. Chest plate, normal. Hæmocultures on Lowenstein, negative.

Treatment.—During the first days the patient received penicillin injections for a total amount of 500,000 units, tyrothricin wet dressings on the purulent lesions, followed by penicillin ointment and generalized ultra-violet rays. After a month very little improvement was observed.

Fig. 3 **Fig. 4**

Figs. 3 and 4.—November 28, 1946, 3½ months after vitamin D2.

On August 12, 1946, high doses of vitamin D2 in an alcoholic solution were given, following the "méthode de Charpy". In the first week the patient received three times 15 mgm. and the second week, twice. Calcium gluconate was also administered orally, at the dosage of 0.5 gm. daily. No other treatment was added. In these last two weeks, it seemed that there was more improvement than in the last month. The patient was then discharged and carefully instructed to take her medication regularly (vitamin D2 twice a week for two more weeks, and once a week after).

Clinical course.—The patient was seen on October 16, two months after the beginning of the treatment. There was a surprising improvement. The ulcerations of the face, the left elbow and left hand were healed. Only one ulceration was still present, but had decreased in size, at the inner aspect of the left knee. All the elevated patches were flattened, and their colour had changed from red-brown to pink. The lips were much less œdematous. The active lesions were in many areas

replaced by a white scar tissue in which the lupomas were imbedded. The pre-auricular and cervical adenopathy had almost completely disappeared. The patient said that the improvement was slow in the first three weeks at home, but became much more pronounced after a month. At that date she was able to enjoy spicy foods, which she had found impossible to eat before, on account of the burning pain due to the ulceration of the lips. Her morale was better.

On November 28, three months and a half after the beginning of the treatment, she came for a check-up. The improvement was still more evident (Figs. 3 and 4). No ulcerations were seen. The diseased skin was soft, non-œdematous, whitish and atrophic in many areas, covered by a few adherent scales. In these patches, composed for the most part of scar tissue, the lupomas looked reduced in number in the centre, but were still numerous at the border. It seemed that we were looking at a lupus vulgaris with a diascope. Only one little calcified node was present in the left cervical region.

The patient was as enthusiastic as we were about the result obtained with this medication.

DISCUSSION

It appears that this case of extensive lupus vulgaris, of twenty-nine years' duration, is a good illustration of the efficacy of vitamin D2 in an alcoholic solution, in the treatment of this disease. Further observation of this patient, with repeated histopathological examinations, will be necessary to confirm the clinical as well as the anatomical cure.*

The impressive results obtained, and the absence of toxic reactions, are sufficient to say that vitamin D2 will be the treatment of choice of lupus vulgaris, and other tuberculous manifestations of the skin. It seems to have a definite beneficial action in some forms of pleurisy, peritonitis, orchi-epididymitis, and scrofuloderma.

The mode of action of this drug against tuberculous lesions is still unknown, but its bactericidal action, as well *in vitro* as *in vivo*, toward Koch bacilli, has been reported by Raab.[2]

It is possible that other routes of administration (intramuscular, intravenous, and even intraspinal) would be more efficacious, if a faster action is needed. The solvent is surely of predominant importance. English authors,[3] who used vitamin D2 in oil, did not obtain as good results as the French,[4, 5, 6] who used an alcoholic solvent.

SUMMARY

The treatment by the "méthode de Charpy" of an extensive case of lupus vulgaris, of twenty-nine years' duration, is reported. A spectacular result was obtained in three months and a half, by the use *per os* of high doses of vitamin D2 in an alcoholic solution.

The use of alcohol as a solvent seems to be superior to that of oil.

This medication, which seems to be the treatment of choice of lupus vulgaris, may be also effective in tubercular lesions of other organs.

We are indebted to the British Drug Houses (Canada) who at our request, prepared and graciously supplied vitamin D2 in an alcoholic solution (Radiostol 15).

* Further observation of this patient and additional cases of lupus vulgaris now under treatment, will be published later.

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MULTIPLE MALIGNANCY CURED BY SURGERY*

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In 1932, under the title of "Multiple Malignancy with Apparent Cure",[1] a rather unusual and most interesting case was reported showing the following periods of survival after multiple forms of malignant disease treated by surgical procedures.

1. Scirrhus carcinoma right breast, operation 1904—survival for 20 years.

2. Epidermoid cancer skin of nose, operation 1917—survival for 15 years.

3. Fibro-sarcoma right leg, amputation October, 1921—survival for 11 years.

It is to be noted that, in the case of the sarcoma of the leg, the first excision of the tumour was performed January, 1921, at which time a mass of femoral glands was removed showing the same microscopical appearance as the primary growth. The amputation in October, 1921, was done through the mid-thigh, at a point below the site of removal of the excised glands.

In 1932, at the time of publication of the report above mentioned, the original slides were restained and again examined. The late Prof. L. J. Rhea, of the Montreal General Hospital, made the statement that, after the lapse of almost twelve years and in the light of cumulative

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experience, he considered the tumour as even more virulent than he had suggested in his original report.

The patient lived very comfortably for many years and made two trips to Europe. In 1936, she developed diabetes and was under the care of Dr. I. M. Rabinowitch. In 1940, she had a cerebral incident and developed a left hemiplegia. She almost completely recovered in a period of months. In November, 1941, she began to have symptoms of cardiac trouble (diagnosed as "cardiac asthma").

She died February 12, 1942, at the age of 89 years. At no time did she show any symptoms which might be considered as due to recurrence of or metastases from, any of her three proved malignant conditions.

This case is now being finally reported as one of three different forms of malignant neoplasm with unusually long survival after operation. Indeed, it may be considered as cured by surgery. The periods of survival are as follows:

1. Carcinoma breast, operation June, 1904. Survival for 37 years, 8 months.
2. Rodent ulcer skin of nose, operation 1917. Survival for 25 years.
3. Sarcoma leg, amputation October, 1921. Survival 20 years and 4 months.

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MIXED TUMOUR OF THE PAROTID WITH METASTASES*

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A mixed tumour is defined as a complex embryonal tumour which reproduces the normal development of the tissues and the organs of the affected part. A teratoma, on the other hand, is composed of recognizable tissues and complex organs derived from more than one germ layer, and an embryoma consists of tissues of all three germ layers which are arranged in orderly imitation of the fetus.[10] McCallum, quoting Wilson and Marchand, fixes the histogenesis when he defines the mixed tumour by stating that it represents a teratoma derived from the isolation of cells already in an advanced state of differentiation and whose capabilities are therefore limited.

In the past there have been many theories concerning the origin of the mixed tumour of the parotid gland. Ewing[10] concludes his discussion of the histogenesis of the tumour by stating "that no single source of mixed tumour meets all the requirements. Some are adenomatous and probably arise from the acini and ducts of the gland in which they are incorporated. Others are encapsulated or extraglandular and take the form of basal cell or adenoid cystic epithelioma. These possibly arise from misplaced and occasionally, embryonal portions of the gland tissue". Branchial remnants may be connected with this group.[11] Boyd[12] epitomizes the etiology by presenting the two best substantiated theories: one holds to the view that the tumours arise from embryonic rests, the other that they are true adenomas of the parotid gland.

The tumour is first seen as a well encapsulated small, pink to red nodule either in or on the parotid gland. Not uncommonly however multiple tumour sites are noted. At a later date it loses its capsule and infiltrates the surrounding gland tissue. The growth varies in consistency from hard to soft depending on its component tissues and whether or not large cysts are present. Upon section a mucous secretion is commonly noted and often within the solid portions of the tumour there are multiple small cysts. The microscopic appearance is varied. The commonest type shows wide zones of epithelial cells which surround or fade into mucoid connective tissue or cartilaginous tissue. The epithelial cells may vary in their form from adenoma to the compact basal type. Multiple foci of lymphocytes and lymphoid tissue are found throughout the stroma.[10]

The mixed tumour is by far the commonest neoplasm involving the parotid gland. Though it is termed a "benign lesion" it shows a tendency to recur and even to become locally invasive if not completely excised. The percentage of recurrences following surgical removal of the tumour has been estimated by many workers, and it is to be noted that as the years have passed and the surgeon's knowledge of the clinical and pathological nature of this tumour has increased, the number of recurrences has steadily decreased. McFarland[1] placed the percentage of recurrences at 25. Even though an average of one case in four recurs, it is rare for

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the tumour to metastasize to either the regional glands or distant organs.

A brief review of the literature reveals reports of but 25 cases in which metastases occurred from a mixed tumour of the parotid gland. Porter and Churchill[2] reviewed nine such cases, one of which was their own. Olsen[3] presented three cases in 1937. Montanus,[4] in 1930, cited Nasse's[1] two cases, the single cases of Partsh, Rispal and Sammiac, Forgue, Morgue, Molmes and Villa and added his own case. Single cases were reported by Charbonnell and Chabe (cited by Perrin[8]), Fitzwilliam,[5] Livingston,[6] Kammerer,[7] Perrin,[8] McFarland[1] and Kornblith.[9] The tumour cells were disseminated by the lymphatic route in but six of these cases. In two of the cases reported by Porter and Churchill, and in those of Nasse, only the regional lymph nodes were involved, while in the single cases of Montanus and Kornblith dissemination by both blood and lymph stream had occurred. In those cases in which the blood stream was invaded the lungs and pleuræ[3, 4, 5] were most often involved, the remaining metastatic lesions did not show a visceral predisposition and secondary foci were reported involving the cranial bones, the lumbar vertebræ,[8] the skin[4] and the liver.[7]

C.O., a female, aged 33 was first admitted to St. Michael's Hospital on March 11, 1942. She stated that three months prior to admission she noticed (for the first time) a small lump behind the left angle of her mandible. The lump slowly increased in size but there was no pain or tenderness associated with it. Examination revealed a firm mass in the left parotid region. This mass extended from the arch of the zygoma to a point 2.5 cm. below the angle of the mandible and from the ramus of the mandible to the mastoid process. A sialogram on March 12, further confirmed the nature of this mass and gave additional information in regard to the degree of involvement of the gland. On March 19, the tumour was excised through a vertical incision extending from the arch of zygoma to a point slightly below the angle of the mandible. The tumour was of varying consistency, irregular in outline and appeared to involve the entire parotid gland.

The pathologist described the microscopic appearance of the tumour as "showing an abundant fibrous stroma which in places had undergone mucoid change. Scattered throughout this stroma are numerous large cell masses. The tumour cells vary in appearance, but for the most part are small and round with deeply staining nuclei and scanty cytoplasm, which in many cells is acidophilic and elsewhere is clear and unstained. In places the cells form definite small acini, elsewhere they have undergone mucoid degeneration with the formation of small cysts. Certain solid accumulations of cells suggest the formation of "pseudo-cartilage". The growth is moderately vascular and small areas of hæmorrhage are to be seen". The diagnosis was "mixed tumour of the parotid".

Following the operation a left facial paralysis was noted. Throughout the patient's entire stay in hospital there was a daily afternoon spike of fever to 99°. She was discharged to her home March 13.

The patient was re-admitted October 26. At that time she complained of a mass in the left parotid region that had been present since May. It began as a small nodule just anterior to the ear, and as it increased in size it became painful. She stated further that the hearing in her left ear was impaired. She did not complain of headaches.

The mass in the left parotid region appeared to lie wholly in front of the ear and measured 2" x 1". It was somewhat fluctuant in consistency and was fixed to the underlying tissues. The skin was not adherent to the mass. At operation on October 25 a tumour the size of a large walnut was removed. It was deep to the masseter muscle and tightly adherent to it. It appeared to be well circumscribed. The microscopic picture had not altered and the pathologist's diagnosis was mixed tumour of the parotid gland. The patient's post-operative convalescence was uneventful and she was discharged to her home on November 8. The final diagnosis was recurrent mixed tumour of the left parotid.

She returned to hospital for further treatment on September 30. Her chief complaints were nervousness and a recurring mass in the left parotid region. She stated that three weeks prior to admission she experienced a severe nervous attack manifested by crying spells, sleeplessness, loss of memory and marked generalized weakness. For the same period of time she experienced severe headaches, and a buzzing sound in her left ear. More recently she had noted crawling sensations over her left face and ear. In twelve months a weight loss of 28 pounds was noted.

Examination revealed a hard, nodular mass overlying the left ramus of the mandible, which measured approximately 3" x 2". This mass was firmly fixed to the underlying tissues, with the overlying skin freely movable. There were no palpable cervical lymph nodes. The central nervous system examination revealed diplopia, paralysis of the left trigeminal nerve, impaired hearing and left facial nerve paralysis of the lower motor neurone type.

At operation on October 18 this tumour mass along with a portion of the masseter muscle was removed. The microscopic examination of the tumour tissue revealed a cellular and structural reduplication of the previous sections. At the time of discharge (October 28) the patient still complained of headache. The final diagnosis was "recurrence of mixed tumour of the parotid and direct extension of tumour to the left middle cranial fossa".

Ten days later the patient was re-admitted. Her chief complaints were double vision and blurring of vision, headache, loss of sensation over the left side of the face and paralysis of the left facial muscles. Examination revealed marked emaciation, weakness of the ocular muscles, left facial paralysis, diminished sensation over the left side of the face, defective hearing in the left ear and marked bilateral papilloedema. On November 9 the radiological examination of the thoracic and lumbar vertebræ revealed no pathological change. The patient's general condition steadily deteriorated and she died January 18, 1945.

At post-mortem examination the body was found to be extremely emaciated. The normal contour lines of the left side of the face were disturbed by a large firm irregular mass in the left parotid region. This swelling extended from the arch of the zygoma superiorly to the angle of the mandible inferiorly and from the region of the zygomatic process of the maxilla anteriorly to the tragus of the ear posteriorly.

Examination of the brain revealed marked flattening of the convolutions of the cerebrum. The entire left temporal lobe and the inferior portion of the left parietal lobe were of a soft and somewhat cystic consistency. Firm granular pink to red tumour tissue had invaded the entire floor of the left middle cranial fossa, and the floor of the sella turcica. This tumour tissue had further invaded the inferior portion of the left temporal lobe and the hypophysis. The entire left temporal lobe and the greater portion of the parietal lobe showed extensive softening and cystic degeneration.

This cyst-like cavity which measured approximately 6 cm. in diameter communicated with the left lateral ventricle. The cranial bones of the floor of the middle cranial fossa which were invaded and replaced by the tumour tissue, were the body (hypophyseal fossa) and greater wing of the sphenoid bone, the squamous and medial one-third of the petrous portion of the temporal bone.

Exposure of the left parotid region revealed an irregular mass of pink to red granular tumour tissue. The peripheral portions of the tumour mass were of a firm consistency and were irregularly infiltrating the surrounding tissues. The more central portion of the growth was soft and necrotic. The cervical glands of this side were normal in size and consistency.

The pleural spaces were free of adhesions and contained no free fluid. The lungs were normal in weight. Each lung was nodular in consistency. Section revealed widely scattered, well circumscribed round nodules of pink to red granular tumour tissue. These nodules varied in size, the largest being 1.5 cm. in diameter. The bronchi and pulmonary vessels were patent and normal. The remaining tissues and organs revealed no relevant lesions. Microscopic examination of the tissues confirmed the gross findings and showed the cellular character of the tumour tissue to be unchanged.

DISCUSSION

This case demonstrates many features common to mixed tumours of the parotid gland. The patient first noticed a swelling in the left parotid region at the age of 31, and by far the greatest percentage of mixed tumours of the parotid occurs between 20 and 40 years of age.[1, 10, 12] The swelling was present for three months prior to the first admission to hospital. Benedict and Meigs[13] found in their series of 38 cases that there was an average of seven years between the time the patient first noticed the swelling and the admission to hospital. They noted too that if the tumour showed a malignant tendency the patient came to hospital much earlier, presumably because of more rapid growth of the mass.

At the first operation the surgeon observed that the tumour appeared to involve the entire left parotid gland and this point may have some relation to its recurrence. It is generally agreed that the histological structure and even erosion of the capsule is of no value in estimating the prognosis.[1, 9, 10] Kornblith feels that recurrence of the tumour may depend on the fact that one arises from a single focus and another arises from multiple foci. Hamilton Bailey[14] adds further emphasis to this point by dogmatically stating that radical removal will guarantee an absolute cure.

Fourteen months elapsed between the first operation and the reappearance of the growth. This corresponds to the finding of Kennon who reported that most of the recurrences occurred in the first twelve months. However, it is well to note that intervals as long as 30 years have occurred between operation and recurrence.[1, 10] McFarland estimates that 79% of those cases in which the growth recurs are cured by subsequent operation or operations. It is usual for the surgeon to have been aware of the malignant nature of the tumour for a long period before the appearance of the metastatic lesion. So commonly does this occur that one worker writes that metastases develop only after several recurrences and local extension of the tumour. The metastases to the lungs in this case occurred in the final two months of life. It would appear that while complete excision of the gland and the immediate peri-glandular tissues may seem an unduly radical procedure in many cases of mixed tumour of the parotid, it is the only treatment which ensures a permanently successful result.

I am indebted to Dr. William Magner for permission to publish this case report.

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MASSIVE PULMONARY EMBOLUS ON THE OPERATING TABLE

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We were doing the second stage of an abdominoperineal resection of the rectum. The patient was 65 years of age with previous average health and had had a first stage colostomy and exploration ten days before. She had been adequately prepared with sulfasuxidine and transfusions. Her wounds were clean and her colostomy was functioning well. She had been given 13 c.c. of nupercaine spinal anæsthesia and one hour had passed since the operation had commenced. The operation had progressed very satisfactorily. The growth had been freed to the tip of the sacrum. There had been no bleeding after the mass ligation of the superior hæmorrhoidal vessels and the peritoneal floor had been closed over the lower

loop and the upper loop had been closed. The abdomen was being closed.

At this time it was noted that the patient was passing gas through the colostomy. At this time also one of us (A.K.M.) noted that she became restless and complained of pain in her side. Up to this time she had been very quiet, answering when spoken to, and had had a blood pressure up to that time of 120/80 which was about the pressure at the commencement of the operation.

The patient was given one c.c. of pentothal thinking that she might have some discomfort from the spinal anæsthesia effect wearing off. However, she became more restless, pulled up an arm and had a slight convulsive seizure of the face. When asked if she had pain she did not reply. Her eyes rolled back and there was slight cyanosis. The oxygen mask was used for artificial respiration and intracardiac stimulants were given but the pulse was not felt thereafter and the patient did not breath voluntarily after that time. The oxygen did not help the cyanosis.

Post mortem examination was made. The abdominal and peritoneal wounds (the operation had been completed post mortem) showed no unusual features. The pleural cavities were clear but the lower lobes of both lungs showed slight superficial subpleural hæmorrhages. The left ventricle and aorta were completely empty. The right ventricle was dilated and the tricuspid valve easily admitted four fingers. The pulmonary artery was completely blocked by three or four worm-like blood clots which were traced into both main branches and were continuous with clotting extending into the smaller branches of the pulmonary artery.

The cause of death was undoubtedly massive pulmonary embolus which had its manifestations in the middle of an operative procedure. One might think that this would give an ideal opportunity to perform a brilliant Trendelenberg pulmonary embolectomy. However, the pain masked by the sedative and by the operation made it difficult to be sufficiently certain of the diagnosis in time to do the life-saving operation required in such a case.

The source of the embolus was obscure. Did it arise during the manipulation necessary to free the rather extensive new growth in the rectum, or was it from the deep veins of the lower extremities? It is also interesting that this patient was on penicillin between her first and second operations. And lastly, after seeing the extent of the ramifications of the clot in the pulmonary system one doubts whether any operation could have been life-saving.

We do not know the frequency with which a pulmonary embolus may occur on the operating table, but this case which has come to our attention should serve to remind others that such a calamity may coincide with operation and some one may have the good fortune to successfully deal with it.

SPECIAL ARTICLE

MODERN MEDICINE IN CHINA: ITS DEVELOPMENT AND ITS DIFFICULTIES

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Although Western medicine has been practiced in China for more than a hundred years since it was first introduced by Dr. Peter Parker, it is only within the present century that significant progress and expansion has occurred. Dr. Parker, originally with the British East India Company, upon visiting the China Coast and seeing conditions there, determined to work permanently in China. Upon the close of the voyage he immediately terminated his contract, returned to China under a mission board and started his medical work under very adverse conditions in Canton. From this humble start has developed the present medical profession in China with its hospitals and medical schools scattered throughout the country.

By the last decade of the nineteenth century western medicine had its roots well secured in Chinese soil and from that time onward there has been a constant forward development, which, with each decade, has assumed a more rapid pace. With their thinking following along the stereotyped lines of their ancestors it was difficult to move the non-modernized Chinese. It was only when western education had rooted itself and the flower was in bloom that these changes could develop as they are now doing.

It can be truthfully said that for the first sixty years all the spade work toward educating the people to accept this new style of medical practice was done through the efforts of missionary doctors. For them it was much more difficult to develop a practice than it is for present day graduates. All sorts of ways had to be thought out to entice someone to submit to medical, or what was worse, surgical, treatment. Beggars were offered food. Others were offered travelling fees. Some were even paid so that they would come to be treated by this white blue-eyed devil about whom few knew anything except that he seemed kind. And if he was so foolish as to use his money this way who were they to do any worrying about the matter?

On one occasion the Chinese friend of a missionary fell seriously ill. A whole succession of doctors failed to make any impression on his illness in spite of the multiplicity of their treatments. "You are far too valuable a man in your community to permit yourself to gradually die in this way. Why will you not let our mission doctor treat you? I believe he can cure you" entreated the missionary one day of his friend. The patient finally consented to

enter hospital provided that he was first permitted to try the three remaining herbalists in the city, hoping that they might succeed. They tried their cures ineffectively and the patient entered hospital. Dramatically quinine worked its miracle. Within three days he was walking about a well man. Some time later he made enquiry of the charges for this cure which nobody else could effect. A diplomatic missionary passed off the question and made the suggestion that a very fine property, under ban because the pagoda towering upon it had failed to halt the fire dragons during the previous year, might be made available by purchase so that a modern hospital might be erected there for the benefit of hundreds of others who like himself might be cured of their illnesses. Would he give his assistance in trying to secure the site? Who could refuse a request of that kind? Today that city boasts a hospital upon one of the finest sites imaginable just because one man was cured by quinine.

EFFECTS OF WAR

But those days have largely passed and instead of having to wait for patients, they flock in by the score, and most of the hospitals are unable to meet the demands made upon them. Thirty odd medical schools were functioning at the beginning of the Sino-Japanese war. Some have not yet been able to graduate any of the five hundred or so men and women who were in attendance when war broke out, disrupting them altogether.

For about twenty years nursing schools had been turning out increasingly greater numbers of nurses. First these were men. Later as girls became educated and moved outside their homes they too consented to be taught the fascination of nursing. By 1940 not a man was left in the nurses training schools. They had been completely supplanted by women.

At the beginning of the war some three hundred and fifty hospitals were active in China, of which 75% were mission-controlled or supported. Some 12,000 doctors were on the medical register of the National Health Administration, only half of whom were fully trained men who could work in hospitals efficiently or teach in the medical schools. Most of the others had walked the wards with missionary doctors or graduated as nurses and turned to the profession for a living. The preponderance of nursing schools, 85%, were controlled and developed by missionary endeavour just as medical science and hospitalization had been. Even the best equipped and stocked of these had no more than sufficient expendable supplies and equipment to carry on for longer than a six month to a year period.

War came followed by bombings. In Chungking for instance five of the six hospitals within the city were hit, some of them twice in the hundred and forty odd bombings to which the city was subjected. Losses of irreplaceable equipment and drugs were considerable. By the end of the war nearly 50% of all the hospitals in China had been completely destroyed or looted.

EFFORTS TO CARRY ON

In face of increasing demands, and with conditions such as to force the medical schools to decrease their number by half thus decreasing proportionally the numbers graduating therefrom, this was a serious situation. Combined with complete disruption of sources of medical supplies and transportation as from December 1941, with a markedly increased incidence of infective disease particularly among students, together with other factors, the hospitals became desperate. What were they to do that they might continue their ability to function?

Various relief agencies including the Red Cross Societies of various countries entered the picture. In 1943, by which time many medicines not locally produced were totally unavailable in China, the American Air Command was persuaded to permit medical supplies in limited quantities to be flown over the "Hump". From fifty to eighty tons a month was the maximum ever permitted but often this amount fell to five tons or even less.

Valiantly the Natonal Health Administration of the Chinese Government tried to manufacture some drugs from chemicals on hand or locally available. They also made sterilizing equipment and some instruments. These were all of poor quality of steel and did not stand up to the strain of hospital wear. Forceps would twist or bend in one's hand if the slightest undue pressure was used. A needle driver handle or beak would bend in the middle of an operation. Always we were working under the utmost difficulty, but at least nobody was better off than his neighbour.

The war concluded, therefore, with all active hospitals possessing a wornout plant requiring very heavy rehabilitation and almost complete replacement. Relief supplies in most cases had been just sufficient to keep the hospitals running in the best fashion possible and the equipment from completely falling to pieces.

I mentioned above the serious increase in incidence of disease. This was the result of the heavy mass migration and refugee movements combined with fatigue, poor food and lodging, and all the other factors incident to such movements, since much of the travel had to be done on foot. The worst difficulties arose from the dysenteries, typhoid fever, and tuberculosis. Always a big problem, involving a large part of the population under normal conditions, the toll of these was terrific. Tuberculosis normally affecting from 5 to 8% of the population rose to 40% in the student body of one of the medical schools. Millions died of intestinal infections. Hookworm and malaria pulled down

the vitality of the masses who had nothing to treat themselves with. Syphilis increased heavily in the Japanese-controlled areas. Postnatal tetanus continued as of old because there was no antiserum to give the newborn delivered at home. Relapsing fever claimed its victims who could have been saved with a single injection of 914. This was China during the war years.

In the spring of 1946 I had the opportunity of travelling more than ten thousand miles from one end of China to the other. Destruction was everywhere but curiously enough here and there was a hospital that did not seem to have been either troubled or damaged by the Japanese. In one of the best equipped of these I found the bedding just one mass of patches. The only thing to which it could be compared was a beggar's garment, except that the bedding was clean and neat. In spite of that the the hospital was filled to capacity and not a single bed was available.

At the other extreme was a hospital with four walls and a roof and a single remaining iron bed. Canadian Aid to China immediately after the surrender sent a party of some seventy men, the Friends Ambulance Unit, into this area to do general relief work and rehabilitate hospitals requiring it, for here famine had raged for three years previously. Trees had to be cut down on the mission compound and sawn into boards. These were laid upon trestles. Cotton was bought from a nearby factory—one of the places where cotton was plentiful—sewn into bedding and the place was ready for occupancy. A twelve thousand dollar surgical unit still on the ship was hurriedly unloaded, flown to the area and within three hours of arrival the first patient was on the operating table to "baptize" the unit. One more hospital was, in this rough and ready fashion, put into shape to carry some of the share of the medical burden in Honan province.

Elaborate plans had been made conjointly by the National Health Administration, UNRRA and the Council on Medical Missions for UNRRA help in this rehabilitation of hospitals. But the best laid plans sometimes miscarry. When supplies arrived they did not materialize as planned. Instead of well organized lots according to specification, shiploads of whatever might happen to be at Okinawa or the Philippines arrived in Shanghai. They contained nobody knew what. Of some articles there was enough and to spare already in China. Other items were suitable for army use but useless for permanent rehabilitation purposes. Other equipment had missing parts rendering them useless.

The whole story adds up to the fact that China's hospitals have not by any means received what they require. And with UNRRA stepping out of the picture shortly voluntary agencies of all countries are being pressed to continue their work for a further period until China's hospital rehabilitation program brings them to the point where they are able to function normally.

THE FUTURE

The plans for the future of medicine in China are hopeful. Where formerly each hospital has been a self-contained unit operating independently present plans under a very active and sympathetic National Health Administration envisage a general improvement in the quality of, and co-operation between, individual hospitals. The aim is to increase rapidly the total number of hospitals in China to 655, of which the mission hospitals, 250 of them, form the nucleus.

But this is not possible until there are sufficient graduates in China to man these institutions. Mission and Christian hospitals and medical Schools therefore must for the present be the backbone of medicine in China, though the Chinese are rapidly taking hold. There are many grade A hospitals in China and these are willing to fit into a co-ordinating plan to provide a place where China's students and graduates will receive their clinical training both within and without the university centres. It is toward this end that foreign groups in China are working.

The whole future of western medicine in China therefore hangs in the balance, depending on the Canadian or American or British reaction to our Chinese medical friends. With our assistance their program can be hurried along, without it they will have a slow uphill fight. If we are at all interested in China's progress that help must be forthcoming. For it is only thus that strong cultural ties and ultimate goodwill and friendship can be developed.

The great threat of our age to human welfare, is that societies led or driven by industrialism are gathering the individual into their fold as a service unit. The individual as a member of society thus must do a society's bidding, regardless of the particular pattern that social organization might temporarily represent. To the true scientist, the present frame of social organization is not the end of all wisdom but just another phenomenon to be viewed objectively. The scientist's limits are the boundaries of the universe, and his function cannot, without destroying him, be limited to the service of any particular social order. Industrial, social, religious, and political patterns are not yet drawn to serve mankind. It is to be hoped that each governmental power will provide an oasis for students who are individual elements of mankind first and servants of society last. Otherwise, intellectual growth will wither and die. Medicine is dedicated to the service of man and not to a social order. In this relation, medical research in its broadest sense has a pre-eminent call upon every social structure for support not merely for immediate needs but for the discovery of broad principles upon which the health of mankind depends. Let each social order therefore give the scientist a free hand and provide him with the environment and the tools he needs; make him accessible to students; . . . make the university his home, and otherwise, for humanity's sake, leave him alone.—E. W. Goodpasture, *Science*, November, 1946.

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EDITORIAL

THE SCHEMM DIET IN THE TREATMENT OF ŒDEMA

FEW conditions in clinical medicine have given rise to more discussion through the years than that of œdema, and as is often the case when the pathogenesis is obscure, changing theoretical conceptions have led to varied therapeutic regimens.

For many years one of the cardinal principles of therapy in œdema has been the limitation of fluids. Schemm notes that such a regimen has not always been popular and quotes from a number of medical authors of the 18th century. One such statement is from William Withering in 1777.[1] "I allow, and indeed enjoin, my patients to drink very plentifully of small liquors through the whole course of the cure," and he added in 1785, citing 163 cases, that: "This direction is the more necessary as they are very generally prepossessed with an idea of drying up the dropsy by abstinence from liquids and fear to add to the disease by indulging their inclination to drink."

The accumulation of knowledge regarding the rôle of the sodium ion in water balance regulation has led workers in recent years to an appreciation of the part played by this electrolyte in œdema formation. Œdema is simply an increase in the interstitial fluid, and sodium is essential for its formation. Warren and Stead[3] suggest that the first event to occur in the cardiac patient who becomes œdematous is a decreased ability on the part of the kidney to excrete sodium. The retained sodium leads to an increasing volume of extra-cellular fluid, and associated with this there is an increase in blood volume and a rising venous pressure. Just why the kidney's ability to excrete sodium is impaired is not explained. This theory of œdema formation is not generally accepted but the importance of the sodium ion is undoubted.

Following the teaching of Newburgh, Schemm[1,3] in recent years has vigorously advocated a dietary regimen in œdema therapy which he believes to be physiologically more rational and more efficacious. In place of fluid restriction, a free fluid intake is permitted of 2 or 3 litres, and in some cases, the water intake is raised to as much as 6 litres. It is believed that only with large volumes of water can the kidneys act efficiently in the excretion of sodium. Used in conjunction with the other necessary features of the diet no adverse effects have been noted by these liberal amounts of fluid in congestive failure.

Associated with this fluid allowance, the diet is low in sodium salts, 2 gm. or less, and it is balanced so as to yield a neutral or acid ash with the object of preventing "the neutralization of metabolic acids which mobilize already stored sodium, and prevents the retention or 'storage' of what sodium is taken in the diet."[3] It is to be noted that the generally used "low-salt" diets may contain anywhere from 3 to 6 gm. of sodium chloride.

Thirst, which may be a troublesome feature for the dropsical patient, is relieved but the diet is tasteless and unpalatable to many and some apparently regard their œdema as the lesser evil. Furthermore, it is obvious from every-day clinical experience that not all œdematous patients require the dietary restrictions demanded by this regimen. It appears to be applicable to those cases in which œdema persists despite the usual measures of rest, digitalis and diuretics.

Schemm has reported a gratifying experience with 402 cases. Other workers[4,5] have recorded their results in smaller series, and apparently look with favour upon the achievements of this regimen in cases of obstinate congestive failure. They consider that a wider clinical experience with this form of therapy is indicated. The Schemm regimen is not designed to replace older methods of dealing with œdema but is to be regarded as an adjuvant to therapy in cases of severe œdema. Its value will gradually be assessed as wider clinical experience with it is gained.

A. L. JOHNSON.

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EDITORIAL COMMENTS

Soixante-quinzième anniversaire de l'Union Médicale du Canada

Au mois de décembre dernier on célébra le soixante-quinzième anniversaire de l'Union Médicale du Canada, avec laquelle se fusionna en 1938 le "Bulletin de l'Association des Médecins de Langue Française de l'Amérique du Nord". L'occasion fut soulignée par un dîner au Cercle Universitaire de Montréal. Un grand nombre d'amis de L'Union Médicale se sont assemblés pour présenter leurs félicitations et bons souhaits. Plus particulièrement le docteur Albert LeSage, rédacteur en chef émérite, a reçu des marques d'estime de ses collaborateurs. Il a été le soutien et l'inspiration de L'Union Médicale pendant 44 ans.

Durant la majeure partie de l'histoire de L'Union Médicale, qui a l'honneur de la plus longue existence ininterrompue des journeaux médicaux canadiens, le docteur LeSage a été l'âme dirigeante du journal. Nous lui offrons nos respects pour son travail, et à L'Union Médicale nos plus chaleureuses félicitations et nos meilleurs souhaits.

Associate Committee for Dental Research

We note with interest the establishment by the National Research Council of an Associate Committee for Dental Research. This has been done at the request of the Canadian Dental Association who have recognized the need for organization of dental research on a national basis. This Associate Committee, which was established in March, 1945, has had several meetings and its work is proceeding favourably. It aims at stimulation of research amongst members of the dental profession, co-ordination of such research, and encouragement of collaboration with other research organizations in problems of mutual interest.

The interdependence of dental and medical problems is only too evident and this attempt to develop dental research should bear valuable fruit.

Health Week in 1947

The first week in February has for some years been selected by the Health League of Canada as "Health Week". The general intention is to emphasize the preventive aspect of disease, especially in those instances in which prevention is not only possible but is most readily practicable. Perhaps pasteurization stands out significantly as one of the measures which has won most recognition, although it is a long way from being as generally practised as it could be. Chlorination of water supplies for towns and cities is another measure of this general type. Some comfort may be extracted from the present situation in Vancouver in that it has served to focus attention on this vital point in our public health defences, and to remind us that we must not complacently regard our water supplies as all safeguarded.

And then there are the other protective links; of vaccination; of toxoid against diphtheria; the general education in early recognition of cancer, and of tuberculosis. It is not easy to keep a steady pressure behind all these public health measures. Health Week is therefore well worthy of our active interest.

Streptomycin

Owing to the greatly increased production of streptomycin by Canadian manufacturers it has now become possible to distribute this product to hospitals without restriction. Accordingly there is no further need for control of its distribution by the National Research Council Committee on Streptomycin. The relatively large amounts now being supplied are available for general therapeutic use and further clinical investigation by the profession at large.

Erratum

In Dr. H. K. Detweiler's paper on "The estimation of liver function" (*Canad. M. A. J.*, January, 1947), the third paragraph, column 2, p. 52, should read: "Complete obstruction of the common bile duct, or hepatic ducts, whether due to stone, malignant disease or infective processes will result in clay-coloured stools containing no urobilin. The urine will contain no urobilinogen, but large amounts of bile."

CLINICAL and LABORATORY NOTES

THE POTENCY OF DIGITALIS WHOLE LEAF PRODUCTS SOLD ON THE CANADIAN MARKET, 1946

M. G. Allmark and A. Lavallée

Ottawa, Ont.

During the past six months a survey of the potency of digitalis whole leaf products sold by Canadian pharmaceutical companies was carried out in this laboratory.* The samples were purchased by our inspectors from pharmaceutical companies located in various cities throughout Canada.

At the present time there are 23 companies selling digitalis whole leaf products in Canada. Some of these offer for sale several dosage forms while others restrict their sales to one or two.

* Pharmacology Laboratory, Food and Drugs Division, Department of National Health and Welfare, Ottawa.

The official cat method was used for all these assays. The reasons for adopting this method were outlined in a previous publication.[1] The results are tabulated in Table I. Tablet and capsule preparations to be satisfactory for sale must be within ± 25% of labelled potency, the tinctures within ± 20%.

There was only one product, and that was a tincture, which did not fall within the limits permitted, and 94% of the products were within ± 20% of the labelled potency.

These results indicate that digitalis whole leaf tablets, capsules, and tinctures sold in Canada at the present time, are of very good quality and physicians may use any of the brands and expect to obtain the desired effect.

TABLE I.

Manufacturer	% of labelled potency								
	½ grain		1 grain		1½ grains		2 grains		
	Tablets	Capsules	Tablets	Capsules	Tablets	Capsules	Tablets	Capsules	Tincture
1	..	..	125	119	..	..	..	..	..
2	..	99	..	111	..	91	..	104	..
3	75	..	81	..	..	..	..	..	..
4	106	..	100	..	..	..	..	..	99
5	..	115	102	108	..	104	..	..	88
6	..	..	..	..	..	..	..	..	96
7	..	..	..	..	94	..	..	..	..
8	..	..	..	..	..	..	..	..	109
9	..	..	..	..	83	100	..	..	109
10	113	..	117	..	123	..	..	..	107
11	..	..	..	..	..	..	..	..	186
12	..	..	..	94	..	..	..	..	92
13	..	..	..	..	80	..	..	..	..
14	..	..	..	..	101	..	..	..	..
15	101	..	107	..	94	..	..	..	..
16	..	..	106	..	..	..	..	..	96
17	..	116	..	109	113	94	..	..	120
18	..	..	106	..	117	..	..	..	119
19	..	..	103	98	..	..	..	..	92
20	..	..	93	..	97	..	..	..	120
21	..	..	103	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	101
23	..	..	..	..	..	..	..	..	101

SUMMARY

1. A survey of the potency of digitalis whole leaf products sold on the Canadian market in 1946 is presented.

2. Only one product was found to be outside the range of tolerance permitted.

3. Ninety-four per cent of the products were within ± 20% of labelled potency.

These results indicate that digitalis whole leaf tablets, capsules, and tinctures sold in Canada at the present time are of very good quality *as determined by the official* method of assay.

REFERENCE

1. ALLMARK, M. G. AND BACHINSKI, W. M.: *Canad. M. A. J.*, 53: 361, 1945.

MEDICAL ECONOMICS

The National Service Act in Great Britain

[*The march of events in Great Britain with respect to the proposed National Health Service Act is brought up to date (within 6 weeks) by the following extracts from the British Medical Journal of December 21, 1946.*]

COUNCIL'S DECISION ON THE HEALTH ACT

The following statement was issued to the Press on December 12 by the Chairman of Council, Dr. H. Guy Dain.

As everyone knows, the medical profession has stated plainly through its Negotiating Committee that the National Health Service Act as passed is in conflict with the principles of the profession. That was the position before the plebiscite was taken. The question posed to the profession by the plebiscite was "Shall we or shall we not enter into any discussions on the framework to be created within the limitations of that Act"? The results of the plebiscite are now known. The Council of the British Medical Association met yesterday to examine the results. The question it plainly had to consider was whether there was a majority and, if so, whether it was a sufficient majority to justify not entering into discussions with the Minister. The Council's answer to both these questions is in the affirmative. It decided to call a Special Meeting of the Representative Body on January 28 next to consider the results of the plebiscite and to approve the following resolution:

> *Resolved.*—That the Negotiating Committee be advised that in view of the results of the plebiscite the Minister be informed that because of the divergence between the principles of the profession and the provisions of the National Health Service Act, the Committee is unable to enter into discussions with the Minister on the Regulations to be made under that Act.

This followed a discussion on the result of the plebiscite, which was presented in such detail as to enable the attitude of every branch of the profession to be assessed.

It was at once apparent that of the doctors mainly concerned—*i.e.*, the general practitioners, 64% had voted against negotiating. As was to be expected, this situation was reversed in the case of men already in whole-time salaried appointments, though the large proportion of those actually in Government service voting against negotiation was regarded as significant.

The poll of civilian doctors was just over 80%, an extraordinary response comparing more than favourably, for example, with the poll at the last two General Elections. Of this, 54% were "No" and 46% "Yes." The Service poll was inevitably small, on account of distance and difficulty of tracing units, only 32% replies

being received to date. Of these 56.3% voted "Yes" and 43.7% voted "No."

An examination of the analysis shows a consistent picture all the way through. In the general practitioner group the young doctors effectively support the majority against negotiation. There is no question of age overweighting the decision.

The B.M.A. is a democratic body and in the light of these figures the Council has no mandate to negotiate.

The position therefore is that the B.M.A. is not empowered to accept any invitation that may be given by the Minister to the medical profession to join him in discussing the regulations to be made under the National Health Service Act. He may have many offers of help, but none from the main body representing the profession.

It is important to remember that the National Health Service Act is not a Conscription Act and that a decision not to join the Service is not disloyalty to the country. Whatever the ultimate outcome the doctors will be loyal to their calling and to their patients, to whom, as always, they owe their first duty.

[Extracts from an editorial in the *B.M.J.*, December 21, 1946, entitled "No".]

"....The Minister of Health has not taken into account the strong individualism which is characteristic of British medicine and responsible for its finest achievements. His enthusiasm for collectivism and centralized power has led him to misread the psychology of the practising doctor and to challenge certain fundamentals of his work. He is trying, in fact, to apply the principle of nationalization to the most individual of relationships between employer and employee—in this case the employer being the patient and the employee being the doctor. The medical profession has been warned by Mr. Bevan's phrase about the doctors not being ripe for plucking, by Mr. Greenwood's statement in the Second Reading debate that the Labour Party's policy of nationalization was unchanged, by the Lord Chancellor's revealing remarks in the Lords debate on the Third Reading which linked certification with basic salary. That the fears of the doctors are not groundless was shown in a startling fashion by the inept decision of the borough of Willesden to turn nurses and doctors out of hospital if they did not join trade unions against their will. The hasty retreat of the Willesden councillors and the repentant messages issued by Mr. Bevan and Mr. Isaacs have deceived no one. It is just that the moment is not yet ripe....."

"....The British Medical Association, the Negotiating Committee, and the Minister of Health are now for the first time fully informed of the considered opinion of the medical profession on the Act and its implications. In the recent past the Minister and various medical publicists have referred to a mythical large proportion of those favouring the Government's health scheme. These matters are now put beyond guessing through a plebiscite which has been answered by over 80% of the medical profession in this country—a truly remarkable poll. No one could or should underestimate the gravity of the situation the poll has revealed. No one, least of all doctors themselves, can be otherwise than gravely disturbed by this profound division between the Minister and those upon whom he must rely to operate the National Health Service Act. The general public and its representatives in Parliament cannot fail to be dismayed when they see on the eve of the putting into force of the National Health Service Act that its provisions are such as to conflict with the principles laid down by the Negotiating Committee, representative of all sections of medical life. Both people and Parliament must surely believe that there is something radically wrong in this Act if the majority of those who are asked to work in it declare that its provisions are such as to convince the majority of British doctors that the Act is against the public good. For this is what the vote means.

In framing his Act Mr. Aneurin Bevan refused to negotiate with the medical profession. This was a one-man decision. The medical profession now contemplates refusing to negotiate with the Minister. This is a decision reached by more than 20,000 doctors—those saying No. The one decision is dictatorial: the second is democratic in the real meaning of the word. It but remains to be pointed out that if the Minister proceeds with his Regulations and fixes an appointed day those doctors who wish to work in it will do so and those who wish to remain outside it will do so. We believe that unless some radical change is made between now and the appointed day the numbers of those deciding upon the latter course will increase. It is for the Minister to find a way out of this impasse."

[From the *B.M.J.*, December 21, 1946]

STATEMENT BY THE MINISTER
PLEA FOR "WISER COUNSELS"

After the announcement of the result of the plebiscite the following statement was issued by the Ministry of Health on December 12:

"The Minister has learnt that the B.M.A. are placing the results of the plebiscite before a Special Representative Meeting with a recommendation that the profession should refuse to discuss with him the steps to be taken to bring the National Health Service Act into operation. He hopes that before any final decision is taken accepting this recommendation, wiser counsels will have prevailed; and he feels sure that the medical profession will take no steps which would make it difficult for them to take part in the comprehensive Health Service which the people of this country so ardently desire.

"Meanwhile, the Minister has a clear duty to carry out the instructions of Parliament as expressed in the Act, and he can no longer postpone the consultations which are a necessary preliminary to the setting up of the administrative machinery. He is, therefore, proceeding to consult all the many other interests which will be concerned in the National Health Service. He is also considering what ought to be done—and this is a matter to which he attaches great importance—to give the medical profession the opportunity of assisting to shape, and of playing its part in, the new service."

MEN and BOOKS

A SHORT HISTORY OF THE TORONTO MEDICAL HISTORICAL CLUB*

Norman B. Gwyn, M.D.

Toronto, Ont.

That a club with a membership so limited as ours should have had an uninterrupted existence of nearly twenty-five years is unusual, and may be explained by our ready conformity to our unwritten constitution, which demands in a member only an agreeable personality and a willingness to contribute to an evening's entertainment. Without this latter requirement for membership, most clubs of our sort soon degenerate into mere social gatherings or disappear entirely. Dr. Crane, of Western Medical Faculty, adds however, in one of his letters, "the surprising thing to me is, that it (the Club) has carried along for the last twenty-three years; most clubs die in early infancy. Evidently there was a need and place for it; otherwise it would not have survived".

The birth of our Historical Club took place under interesting circumstances. Luckily I was able to get the important details in connection with the birth from Dr. Crane direct, and from the excellent notes made by Dr. Tovell in the early days of the Club's existence. Dr. Crane seems to have been the one most responsible for originating the idea of forming a historical club and in this connection we may reproduce one of his letters at length:

"The birth of your Historical Club in Toronto is rather unique. In February, 1923, I was doing some research work in Toronto with Dr. Banting, and I received a London paper stating that Dr. J. J. Walsh of New York was coming to London. I was anxious to meet him because I had read his books and had heard that he was a splendid speaker. So I went over to Brunswick Avenue and called on Paul O'Sullivan because Paul is a devout Catholic, the same as Dr. Walsh. I asked Paul if it would be possible to persuade Walsh to come to Toronto, and after we had discussed that problem, Paul started in to tell me about Servetus. After a half hour's dissertation I said to Paul that it seemed a shame that others in Toronto couldn't have the same privilege that I was enjoying, and I suggested that he invite a group to his home and have him repeat the paper. The first man I called up was Jabez [Elliott] and between the three of us we picked out about a dozen or more men. Then it occurred to me that this would be an opportunity to form an historical club. At the meeting* I suggested a certain number of other names, and increasing the size of the Club, but it was unanimously decided that the membership be closed and that it be known as the 'Toronto Medical Historical Club'. Before the next meeting I came back to London and I think I have only attended two or three meetings since its inauguration. I think Jabez was the first president but I am not sure of the names of the other officers. So I have had very little to do with your organization since 1923."

The Dr. Walsh to whom Professor Crane refers was the late Professor J. J. Walsh of the Medical Faculty of Fordham University, the well known Roman Catholic Institution in New York. An exceptionally well versed student of the history of medicine, one finds him referred to in the Garrison *History of Medicine* no less than eleven times. He was the author of a history of medicine in North America and contributed extensively on the subject. He was professor of nervous diseases as well as professor of the history of medicine, and at the time of his death in 1942 was Dean of the Medical Faculty. One remembers that years ago one of his contributions bore the title "The Thirteenth, Greatest of Centuries". This provoked an active discussion in which Sir William Osler took a leading part.

Whether Paul O'Sullivan read his paper on Servetus to a selected group I cannot determine. The first gathering of those interested in the history of medicine seems to have been at Dr. Elliott's house and little else took place so far as the organization of the Club was concerned during 1923. The ferment however was evidently at work and a formal meeting must have been arranged for January 24, 1924, at the house of Dr. Elliott.

A congenial group had been gathered together—Sir Bertram Windle, Drs. H. B. Anderson, J. N. E. Brown, Arnold Clarkson, George Porter, Professors Brett, Horace Speakman, Wasteneys, J. W. Crane, of London, Ont., and Dr. Paul O'Sullivan. With Dr. Elliott these enthusiasts made up the membership at this first meeting. Dr. Elliott as host was installed in the chair, a secretary, Dr. Paul O'Sullivan, was elected and Judge Riddell, Sir Bertram Windle and Professor J. W. Crane were elected to honorary membership. The business of organization then began. Dr. Elliott outlined the purposes of

* Read before the Toronto Medical Historical Club, October 18, 1946.

* After twenty-three years Dr. Crane's memory might be a little uncertain. One notes on page two that he has called up Jabez Elliott after being in touch with Dr. O'Sullivan and the three of them came together, discussed matters and suggested the names of a dozen or more men. This is not the meeting to which he refers two or three lines below. The meeting at which he suggests a certain number of other names, and increasing the size of the Club was the larger gathering which took place at Dr. Elliott's house at a later date.

calling his guests together. These were to encourage research in the history of medicine in general and in the history of Canadian medicine in particular. He suggested that the Club should collect and preserve any article of historical value.

Following the open general discussion, the Chairman called for suggestions as to what form the Club should take. Dr. Anderson proposed an organization which might add to its numbers at any time. Professor Speakman emphasized as a start the study of general medicine. Professor Wasteneys urged that each member be allowed to develop his individual taste. Dr. Porter felt that the historical section of the Academy of Medicine was quite inadequate for its purpose and that a medical historical club would fill a long felt want. Dr. J. N. E. Brown favoured an open membership. He suggested that the Club meet at Hart House and dine. He did not feel that the Club should limit itself to things dealing purely with medical history. He thought that immediate attention should be paid to our local history since the pioneer men had dropped or were dropping out.

It was finally decided that meetings should take place at the homes of the various members. There was to be an executive committee of three. The member at whose home the meeting should take place was to be the host, the chairman, and to be responsible for the evening's program. The Club was to have a limited membership of about thirteen or fourteen since in many cases the homes of the various members were hardly suited for large gatherings. The meetings were to take place once a month during the late fall, winter, and early spring. It was proposed that the Club bear a name such as Osler, Widmer, Workman, following a custom now very general in the medical schools of today but in the end, it was decided that the simple title "Toronto Medical Historical Club" might be more appropriate for an organization which was not limiting its membership to purely medical men.

It would seem that an election of an executive committee took place, but there is nothing to confirm this, and it would look as if such a committee had never carried on. The place and time of the next meeting was decided upon. Dr. H. B. Anderson and Dr. J. N. E. Brown offered to read papers. It was decided that the Club might add to its members and several names were proposed. Dr. Elliott exhibited a number of his interesting and valuable books.

The names of those who might be called the charter members of the Club have been mentioned. In the course of the next meetings, Drs. Tovell and Sir Frederick Banting were unanimously elected to membership. Dr. Tovell was promptly penalized by being made archivist. Having been commissioned by Drs. Allan Baines, Alex. McPhedran and Maude Abbott to give sketches of Osler's early life, it was supposed that I had an historical bent, and might be admitted to select circles. Previous to Sir William Osler's death, however, I had only made one contribution to the history of medicine, a paper read in Baltimore on "Dietl's Aphorisms on Phlebotomy".

Careful scouting revealed the fact that two outstanding characters in Toronto—Professors Oscar Klotz and Playfair McMurrich—were deeply interested in the history of medicine. Companionable and congenial to an unusual degree, they were at once admitted to the Club, bringing the active membership to fourteen. In 1927, following the reading of an excellent paper on the "Psychology of Research" Professor Walter Libby was elected to honorary membership. Dr. Libby, let it be known, lectured on the history of medicine at the University of Pittsburg and is the author of a short and delightful history of medicine. He has as well, made many other contributions on the subject.

At meeting subsequent to 1924, the office of president must have been created, an office to be held for one year. All of the original members held this office in turn, except Sir Frederick Banting and Professor Speakman, whose staff meetings clashed with those of the Club. Professor Speakman was therefore elected to honorary membership in 1932 as was Sir Frederick in 1936. To aid the president in his arduous duties a silver mounted gavel made from wood taken from the ruins of the house in which Sir William Osler was born, was presented to the Club at one of its meetings in 1926. With the election of Professor Holman in 1936 seemed to have begun the custom of making each new member of the Club, president for the ensuing year.

The important position of secretary to the Club was held in succession by Drs. Paul O'Sullivan, Porter and Clarkson up to March, 1945, when Dr. Wasteneys agreed to assume this responsibility. Dr. Paul O'Sullivan, the first secretary, was elected president in the second year of the Club's existence. Dr. Porter is noted as being the second secretary in 1925 and apparently was kept in office till 1941, when he resigned in favour of Dr. Clarkson, who in turn was secretary till 1945.

As early as 1925 Dr. Porter notes, "It was decided that the secretary should take notes of the proceedings and keep them on file for reference but not present them formally each night." As already noted an archivist was early appointed in the person of Dr. Harold Tovell. In a personal letter to me, Dr. Tovell deplores the delinquency of Club members in not handing over to him their papers or communications for collection. Some papers he says are at the Academy of Medicine in the librarian's keeping. Many others on the other hand have been published in various journals, and it is realized, of course, that many presen-

tations before the Club are not in such form that their reproduction is possible.

Such were the foundations upon which the present society was laid, foundations which remained unaltered for twelve years, from 1924 to 1936 save for the death of Sir Bertram Windle in 1929 and the election to honorary membership of Professor Walter Libby in 1927. The limitation of membership to fourteen was steadily adhered to.

An old saying is worded, "Happy the people whose annals are blank in history books",* annals meaning of course, a history of death, wars, pestilence or internal disturbances. These twelve years of the Club's history rolled peaceably by with nothing but the happiest incidents to record—Banting's trip to the Arctic, Klotz's appointment by the Rockefeller Institute to study yellow fever in Africa, Elliott's election to the Chair of the History of Medicine at Toronto, and to the presidency of the American society of the same name. One records with pleasure that Professor McMurrich was asked by the Carnegie Institute to write the life of Leonardo.

The inevitable however, was approaching and Oscar Klotz answered the last call in 1936, barely three months after he had entertained us with an account of the School of Medicine at Leyden. Professor Holman was elected to the vacancy, and Professor Coventry was admitted in the following year, 1937. Professor McMurrich died in 1939, allowing Dr. R. I. Harris to be elected a member of the Club. Two years later, February 21, 1941, Sir Frederick Banting died tragically in a plane accident. His death permitted the election of Professor McIlwraith in the same year. The deaths of Professor Elliott in 1942, and of Paul O'Sullivan and J. N. E. Brown in 1943, permitted the admission of Drs. Shanks, Trebilcock and Daly, while the retirement of Dr. H. B. Anderson made room for Dr. Cameron; since Dr. Tovell finds it difficult to come from the country to the gatherings, a place was found for Dr. Craigie. Professor Brett's death permitted the admission to membership of Professor C. B. Farrar.

I may draw this detailing of organization and personnel to an end by noting that Dr. H. E. MacDermot, of Montreal, the editor of the *Journal of the Canadian Medical Association,* was elected an honorary member in 1943. Among his many contributions in the line of the history of medicine is his life of Dr. Maude Abbott, who without question can be listed as foremost among Canadian medical authors. To conclude I must refer sadly to Dr. H. B. Anderson's retirement, and to the death of one of the first of our honorary members—Judge Riddle—in February, 1945. His interest in the history of medicine is evidenced by his long list of publications. He was often seen at the Academy's historical and literary nights and he is recorded as having contributed one of the first papers to be given before the Club, "Some early medical prescriptions". These prescriptions are now at the Academy of Medicine, as are also several of the Judge's reprints.

How best to put before you the vital part of the Club's performances, the quantity and quality of papers and presentations, is no easy matter. I must spare the blushes of the members present, and time, certainly, will not allow one to make note of all the papers and presentations which the secretaries have listed as having been given. These now number 135 and with few exceptions were contributions by Club members. I can find no mention of paper of presentation by Sir Bertram Windle, nor do I see that he was present at any save the earliest of our meetings. That he had a genuine interest in the history of medicine is shown by a paper he read before the Academy of Medicine in 1922 on "Medicine and surgery in early mediæval England". Professor of anthropology at St. Michael's, and special lecturer on ethnology at the University, Sir Bertram was widely known as a scholar and above all as a kindly gentleman. Some of you may remember his interesting will in which he provided for scholarships for English Roman Catholic students, they, according to Sir Bertram, being the finest type of Roman Catholic.

Present at some of our meetings were guest speakers, such as Judge Latchford of the Ontario bench, who spoke on his collection of shells. Dr. Francis gave the history of the Osler Library at McGill. Dr. Heagerty, of Ottawa, dwelt on the history of Canadian medicine. Dr. Drake, of Toronto, showed his collection of early feeding utensils and Professor Needler entertained us with a talk on the "Lone sheiling" at the last of the delightful entertainments likely to be given by H. B. Anderson. At one of our earlier meetings Dr. Tovell introduced to us Professor MacIlwraith, not as yet a member of the Club, who gave us a remarkable demonstration of the medical practice of the Indians of the West Coast.

This concludes the short history of the Toronto Medical Historical Club, for the details of which I am indebted to the early notes of Professor Crane, to the reports briefly made by the several secretaries already named, and to Miss Poole, librarian of the Academy of Medicine.

* An aphorism of Montesquieu quoted in Carlisle's "Life of Frederick the Great".

It is well to remind ourselves that the progress in control of tuberculosis has been in spite of incomplete and delayed reporting, in spite of the insidious and silent nature of early pulmonary disease, and in spite of the lack of any specific resources for creating immunity for cure in the chemotherapeutic sense.—*Diplomate,* December, 1946.

ASSOCIATION NOTES

COMMITTEE IN CHARGE OF ARRANGEMENTS—ANNUAL MEETING CANADIAN MEDICAL ASSOCIATION, WINNIPEG, JUNE 23-27, 1947

		Office Address	*Phone*	*Residence*	*Phone*
Chairman.....	Dr. F. G. McGuinness	50 Medical Arts Bldg.	96,701	61 Cordova St.	401,613
General Secretary	Dr. T. C. Routley	135 St. Clair Ave. West, Toronto 5, Ont.			
Local Honorary Secretary...	Dr. D. L. Scott	Central T.B. Clinic	27,301	384 Borebank St.	401,288
Local Secretary..	Dr. M. T. Macfarland	601 Medical Arts Bldg.	92,707		
ADVISORY COMMITTEE:					
	Dr. G. S. Fahrni	42 Medical Arts Bldg.	93,605	766 Wellington Cr.	44,220
	Dr. P. H. McNulty	264 Edmonton Street	94,335	138 Harrow Street	43,909
	Dr. F. W. Jackson	Legislative Building	907,435	245 Kingston Row	204,420
	Dr. A. T. Mathers	Medical Arts Bldg.	92,979	340 Dromore Ave.	45,658
	Dr. C. H. A. Walton	Winnipeg Clinic	97,284	28 Middlegate	34,443
	Dr. H. D. Kitchen	18 Medical Arts Bldg.	98,231	364 Montrose St.	403,684
	Dr. J. Roy Martin	Neepawa, Manitoba	151-R2		
	Dr. Stuart D. Schultz	Hospital for Mental Diseases, Brandon, Man.			
	Dr. J. M. McEachern	33 Medical Arts Bldg.	98,231	53 Queenston St.	403,321
BADGES AND SIGNS:					
Chairman	Dr. S. A. Boyd	Fort Osborne Barracks	40,451-323	Ste. 1, 792 Minto St.	35,942
Secretary	Mr. J. Gordon Whitley	601 Medical Arts Bldg.	92,707	125 Garfield St.	
COMMERCIAL EXHIBITS:					
Chairman	Dr. A. M. Goodwin	26 Medical Arts Bldg.	98,231	1260 Wolseley Ave.	72,239
Secretary	Mr. J. Gordon Whitley	601 Medical Arts Bldg.	92,707	125 Garfield St.	
CEREMONIAL PROCEDURE:					
Chairman	Dr. Digby Wheeler	103 Medical Arts Bldg.	93,521	2106 Portage Ave.	61,215
ENTERTAINMENT:					
Chairman	Dr. D. S. McEwen	116 Medical Arts Bldg.	97,706	275 Dromore Ave.	41,384
Secretary	Dr. A. C. Rumball	Deer Lodge Hospital	64,861	159 Woodhaven Blvd.	62,550
	Dr. C. C. Henneberg	27 Medical Arts Bldg.	98,231	Ste. 8, Palliser Apts.	47,109
	Dr. Ross H. Cooper	32 Medical Arts Bldg.	93,103	Ste. 2, Anvers Apts.	43,204
FINANCE:					
Chairman	Dr. W. Grant Beaton	61 Medical Arts Bldg.	92,800	302 Montrose St.	402,707
Secretary	Dr. H. M. Edmison	103 Medical Arts Bldg.	93,521	391 Cambridge St.	40,897
GOLF:					
Chairman	Dr. R. W. Richardson	42 Medical Arts Bldg.	93,605	191 Brock St.	402,414
Secretary	Dr. Gilbert Adamson	Winnipeg Clinic	97,284	727 South Drive, Fort Garry.	41,390
	Dr. T. E. Holland	203 Medical Arts Bldg.	96,948	80 Brock St.	403,139
	Dr. N. W. Warner	404 Medical Arts Bldg.	94,719	236 Yale Ave.	49,674
	Dr. Peere Lund	Deer Lodge Hospital	64,861	55 Green Ave.	504,089
	Dr. W. A. Gardner	52 Medical Arts Bldg.	92,493	1158 Grosvenor Ave.	44,585
	Dr. J. T. Cruise	314 Medical Arts Bldg.	95,317	244 Queenston St.	402,864
	Dr. I. O. Fryer	530 Somerset Bldg.	98,824	Ste. 5, Gloucester Apts.	30,576
HOUSING AND EQUIPMENT:					
Chairman	Dr. D. C. Aikenhead	205 Medical Arts Bldg.	94,154	60 Wilton Street	43,719
Secretary	Dr. Emmet Dwyer	373 Union Station	902,207	207 Montrose St.	401,437
PUBLICITY:					
Chairman	Dr. L. A. Sigurdson	53 Medical Arts Bldg.	94,762	104 Home Street	72,409
Secretary	Dr. J. C. Hossack	416 Medical Arts Bldg.	98,936	820 North Drive, Fort Garry	45,021
REGISTRATION:					
Chairman	Dr. C. W. Clark	10 Medical Arts Bldg.	98,231	351 Yale Ave.	49,492
Secretary	Dr. Cherry K. Bleeks	105 Medical Arts Bldg.	93,273	810 Grosvenor Ave.	49,622
SCIENTIFIC EXHIBITS:					
Chairman	Dr. J. M. Lederman	Medical College	23,693	140 Victoria Cres., St. Vital	205,088
Secretary	Dr. R. E. Beamish	32 Medical Arts Bldg.	98,231	10 Emily Apts.	21,081
	Dr. Gordon Coghlin	50 Medical Arts Bldg.	96,701	9 Linden Court	23,416
TRANSPORTATION:					
Chairman	Dr. F. Hartley Smith	Great West Life Ass. Co.	906,047	86 Tache Ave.	203,993
Secretary	Dr. K. C. McGibbon	52 Medical Arts Bldg.	92,493	870 Wellington Cres.	403,597

LOCAL PROGRAMME COMMITTEE—ANNUAL MEETING
CANADIAN MEDICAL ASSOCIATION, WINNIPEG, JUNE 23-27, 1947

		Office Address	*Phone*	*Residence*	*Phone*
Chairman.....	Dr. F. A. L. Mathewson	32 Medical Arts Bldg.	98,684	Ste. 1, 812 Grosvenor Av.	44,600
Secretary.....	Dr. K. R. Trueman	Winnipeg Clinic	97,284	179 Oxford Street	401,645
ANÆSTHESIA:					
Chairman	Dr. D. C. Aikenhead	205 Medical Arts Bldg.	94,154	60 Wilton Street	43,719
Secretary	Dr. Peere Lund	Deer Lodge Hospital	64,861	55 Green Ave.	504,089
DERMATOLOGY:					
Chairman	Dr. A. M. Davidson	6 Medical Arts Bldg.	95,683	856 Palmerston Ave.	33,416
Secretary	Dr. W. George Brock	413 Medical Arts Bldg.	92,947	124 Elm Street	402,568
MEDICINE:					
Chairman	Dr. J. D. Adamson	Winnipeg General Hospital	87,681	Ste. 5, Shipley Crt.	72,865
Secretary	Dr. J. W. Macleod	Winnipeg Clinic	97,284	226 Oxford Street	401,644
	Dr. Lennox G. Bell	Winnipeg Clinic	97,284	Ste. "D", Hugo Annex	45,789
	Dr. A. Hollenberg	701 Boyd Building	97,223	372 Montrose St.	403,608
	Dr. D. S. McEwen	116 Medical Arts Bldg.	97,706	275 Dromore Ave.	41,384
OBSTETRICS AND GYNÆCOLOGY:					
Chairman	Dr. J. D. McQueen	Medical Arts Bldg.	93,273	283 Yale Ave.	46,936
Secretary	Dr. Elinor F. E. Black	604 Medical Arts Bldg.	94,684	Ste. 22, Wiltshire Apts.	34,351
	Dr. C. R. Rice	505 Medical Arts Bldg.	96,232	Lot 117, East St. Paul	501,352
	Dr. B. D. Best	Winnipeg Clinic	97,284	133 Montrose St.	402,789
OPHTHALMOLOGY:					
Chairman	Dr. Norman Elvin	314 Medical Arts Bldg.	95,317	234 Kingston Row	201,408
Secretary	Dr. John T. Cruise	314 Medical Arts Bldg.	95,317	244 Queenston St.	402,864
OTOLARYNGOLOGY:					
Chairman	Dr. F. D. McKenty	514 Medical Arts Bldg.	92,711	Fort Garry Hotel	98,251
Secretary	Dr. E. J. Washington	202 Medical Arts Bldg.	93,864	40 Waterloo Street	401,145
	Dr. Robert J. Black	416 Medical Arts Bldg.	93,851	54 Hargrave Street	92,073
PÆDIATRICS:					
Chairman	Dr. Gordon Chown	588 Broadway	36,945	285 Montrose Street	402,474
Secretary	Dr. Harry Medovy	401 Boyd Building	93,849	366 Niagara Street	403,716
RADIOLOGY:					
Chairman	Dr. Digby Wheeler	103 Medical Arts Bldg.	93,521	2106 Portage Ave.	61,215
Secretarty	Dr. R. A. Macpherson	118 Medical Arts Bldg.	98,231	370 Oxford Street	401,443
SURGERY:					
Chairman	Dr. P. H. T. Thorlakson	Winnipeg Clinic	97,284	114 Grenfell Blvd.	62,200
Secretary	Dr. C. E. Corrigan	Deer Lodge Hospital	64,861	307 Waterloo St.	401,271
	Dr. M. R. MacCharles	3 Medical Arts Bldg.	98,231	128 Grenfell Blvd.	61,162
	Dr. C. W. Burns	5 Medical Arts Bldg.	98,231	139 Grenfell Blvd.	62,731
	Dr. A. C. Abbott	410 Power Bldg.	95,165	127 Grenfell Blvd.	61,579
UROLOGY:					
Chairman	Dr. C. B. Stewart	Winnipeg Clinic	97,284	318 Queenston St.	402,006
Secretary	Dr. Earl Stephenson	409 Power Bldg.	95,165	1167 Grosvenor Ave.	46,634
HISTORICAL MEDICINE:					
Chairman	Dr. Ross B. Mitchell	404 Medical Arts Bldg.	94,637	524 Corydon Ave.	46,217
Secretary	Dr. Athol R. Gordon	404 Medical Arts Bldg.	96,232	986 Grosvenor Ave.	49,724
ARMED FORCES MEDICAL SECTION:					
Chairman	Lt. Col. G. L. Morgan-Smith, (DMO. Army)	Fort Osborne Barracks	40,451	894 Dorchester Ave.	44,628
Secretary	S/L G. T. Irvine, (P.M.O., R.C.A.F.)	Stevenson Air Field	64,841	Stevenson Air Field	64,841
PSYCHIATRY:					
Chairman	Dr. Gilbert Adamson	Winnipeg Clinic	97,284	727 South Drive, Fort Garry	41,390
Secretary	Dr. T. A. Pincock	Psychopathic Hospital	87,681	Ste. 7, Amulet Apts.	36,588
ALLERGY					
Chairman	Dr. C. H. A. Walton	Winnipeg Clinic	97,284	28 Middlegate	34,443

The General Secretary's Page

Ten years ago, Dr. A. D. Kelly, of Hamilton, joined the staff of the Ontario Medical Association as Assistant Secretary, and, in May, 1938, he succeeded to the secretaryship. Early in 1940, he enlisted in the medical branch of the R.C.A.F. where, for more than five years, he rendered notable service, retiring with the rank of Group Captain. Shortly after his return to his post with the Ontario Medical Association, he was appointed Assistant Secretary of the Canadian Medical Association on a part-time basis, and, on January 1, 1947, he withdrew from the O.M.A. to devote all of his time to the work of the C.M.A. It is indeed with pleasure and satisfaction that your General Secretary welcomes the co-operation of such a worthy colleague on a whole-time basis. Between us, we shall try to keep the home fires burning brightly at the central office and be of every possible assistance to the Divisions.

The Ontario Division has a new Secretary, Dr. Harry Dunham. No, he is not new to the O.M.A. as he has been Dr. Kelly's assistant and understudy for the better part of a year; but he assumed the secretaryship of the Ontario Division on January 1 when Dr. Kelly resigned to become the full-time assistant secretary of the Canadian Medical Association.

Harry Dunham, like Arthur Kelly, hails from Hamilton and he also served in the R.C.A.F. He has a natural flair for administration and the Ontario Division is to be congratulated on having appointed him to the secretaryship.

The Manitoba Division has appointed Dr. M. T. Macfarland, of Cold Lake, Alberta (a veteran of World War II), as its first full-time secretary. Before assuming duty on December 1, Dr. Macfarland spent a month with us at the central office. Unless we are poor judges of people, we predict that Manitoba and Macfarland are going to be highly pleased with one another, and we offer our hearty congratulations to the Division and to its new secretary.

The Saskatchewan Division and our "Secretarial Family" suffered a grievous loss in the death of Dr. J. G. K. Lindsay, of Saskatoon, whose sudden and tragic death a short time ago shocked us all. Although he had a wife and five children, Keber Lindsay felt it to be his duty to enlist in the early part of the war and for five years, most of it spent overseas, he served with great credit to himself and to his country. His place as Secretary of the Saskatchewan Division and Registrar of the College of Physicians and Surgeons of the Province will be hard to fill, but the Division is hoping to find a man who, like Lindsay, will have vision and ability and a strong desire to put service before self.

Not long ago, the Hunterian Society in England staged a debate on the motion "That the Uncontrolled Advertising of Patent Medicines is a Menace to the Public". In an audience of 100, the affirmative won by 92 to 8.

Two interesting observations stand out in the report of the meeting: (1) The main advocates on both sides were laymen, not doctors. (2) The leader for the negative put up the most ingenious if not the most convincing argument when he said that doctors should bless patent medicines because if they had to deal with all the people who frequent the chemists' shops seeking nostrums, the doctors' waiting rooms would constantly be cluttered up with people whom they thought they had seen for the last time and whom they certainly did not wish to see again. So, it may be, Doctor, that you would like to thank the patent medicine man!

It is interesting to note that the last published figure (of 1938) of patent medicine advertising costs for England was a little under £5,000,000. Quite a business carried on to make life easier for the doctor!

Have you made your hotel reservations for the Winnipeg Meeting which is to be held during the week of June 23, 1947? If not, might we suggest that you do so at once by applying to Dr. D. C. Aikenhead, Chairman of the Housing Committee, Medical Arts Building, Winnipeg. It is a matter of extreme regret to the Association that so many of our members were disappointed last year in that they were not able to secure accommodation at Banff. The President-Elect and Mrs. McGuinness and all the men and women associated with them on the convention committees are doing their utmost to provide an attractive program and suitable accommodation for all our members who desire to attend the annual meeting in June, but it is very important that reservations be made early; so please make yours as soon as possible.

MEDICAL SOCIETIES

Montreal Medico-Chirurgical Society

The Pædiatric Section of the Society held a symposium on Poliomyelitis on December 6, 1946. The opening paper by Dr. A. R. Foley, epidemiologist for the Province of Quebec, reviewed the historical aspects of the disease, pointing out its world-wide occurrence. The 1946 epidemic in North America which had assumed such impressive proportions (there were over 23,000 cases in the U.S. alone) first manifested itself in Florida in February and spread north. In Canada sporadic cases began to appear in June, and by late July the epidemic was well established in the Province of Quebec, the peak being reached in mid-August. By the end of September it waned sharply, but a trickle of cases was still being reported even in mid-December. There had been a tendency in this epidemic towards an earlier date of onset and of reaching its peak. The average age of the patients was five years.

Dr. Fred Smith commented on the bacteriological aspects. He felt that on present evidence we must conclude there was only one type of virus involved, compared, for example, with the influenza virus. The polio virus was one of the smallest known and its filter-passing capacity ruled out protection of water supplies by filtration. Nor was it affected by chlorine in quantities within practicable limits. Pasteurization also was not a protection against it. Man is the only known natural host and there is no intermediate mechanism of transmission. The route of infection presented vitally important aspects. There had been a change from the viewpoint which regarded the nasal passages as the only portals. The intestinal tract was now known to be frequently implicated, but other routes were possible, *e.g.*, the tongue and dental sockets. Blocking the portals of entry was not practicable. However, as a corollary, surgical work such as tonsillectomy at the time of an epidemic should be strictly limited.

As regards prophylaxis, no effective measure had yet been evolved. The use of modified virus was still in the experimental stage, although there was some slight indication that it might be of value. Antibody globulins did not seem able to protect the nerve endings and axones hence the abandonment of the serum treatment. It should be understood that the virus multiplied only in the neurone. The axone was only a pathway by which the virus ascended to the cell body. The rate of its travel had been measured experimentally and was found to be about 2 mm. per hour.

Dr. F. W. Wiglesworth dealt with the pathological aspects. Our knowledge of the initial effects of the virus in the human is limited by the difficulty in obtaining tissues at the earliest stages of infection. So far, the earliest time after infection at which tissue had been examined was three days, and even then there was much secondary inflammation. However, from experimental work it was known that the initial effect of the virus was on the body of the neurone: the inflammatory collar which was such a familiar part of the microscopic picture developed as a secondary reaction. The term "anterior poliomyelitis" was misleading so far as it focussed attention on the anterior horn cells as the only point of attack. The posterior horn cells were also liable to be attacked, hence the frequency of pain in the early stages. The virus might also attack any part of the brain stem, witness the bulbar paralyses. The name of the disease however correctly indicated its destructive effects on the gray matter of the cord and brain stem. Emphasis was laid on the fact that the virus might take some time to die out of involved nerve tissues.

Dr. Alton Goldbloom spoke of some clinical aspects of the disease. His impression was that our knowledge of treatment had not altered significantly in the last forty-five years. What we did nowadays was to apply whatever method of treatment seemed to be indicated by commonsense, and of course certain mechanical aids had been evolved. He implied that the treatment by hot pack had not convinced him as having any great value. He commented on various points in diagnosis; how fever may be inconspicuous or even absent; how the so-called "dromedary" fever chart was characteristic and that the neurological symptoms usually appeared with the second rise, the word dromedary however being incorrectly used to refer to the two rises as being like the two humps of a camel, since that animal actually possessed only one hump. The infrequency of paralysis must be borne in mind. He was struck, in his experience of three major epidemics of polio, with the regularity with which certain errors of diagnosis were repeated during epidemic periods. Meningitis of various types always was amongst these errors, and of course this particular mistake could be understood. Amongst other errors he had seen a few cases of lead encephalopathy; osteomyelitis occasionally got into the special ward in error; neoplasms of the cord might also offer differential difficulties; and even scurvy with its pseudo paralyses.

Dr. A. B. Cushing in discussion spoke from his very full and extended experience. His impression was that in this epidemic, whilst it was by far the largest in Montreal in the last 35 years, the clinical aspects had been milder. The mortality was definitely lower, and the paralyses less extensive. He was especially impressed with the efficient manner in which the Montreal hospitals had handled a large, sudden influx of patients, at a time when both accommodation and staff were lacking. At the same time, as this kind of symposium served to emphasize, we still lacked definite knowledge about the disease, its prophylaxis and its treatment. The problem of carriers was a serious one and presented great difficulty.

Dr. W. G. Turner in discussing the problem, thought that much saving could be effected by combating the human tendency to prolong physiotherapy beyond a reasonable recovery period, in the vain hope that somehow, somewhere, nerve tissue would be conjured up. This fallacy ultimately leads to disappointment, trial of other inadvisable treatments, waste of time, delay in physical adjustment and postponement of reconstructive surgery, in addition to great economic loss. Cases of poliomyelitis are not cured. They recover, and we only assist in that recovery.

Dr. R. R. Struthers wasted neither time nor words in making it clear that the meeting had not sufficiently emphasized the value of the Kenny treatment. In his opinion this was a definite addition to our method of handling the acute stages. In his experience, the hot pack treatment left the muscles in better shape for whatever surgical measures might be needed, and this view was supported by the surgeons themselves. He went on to say that he felt there was a tendency on this continent towards an excessively emotional approach to polio as a public health problem. In his work with UNRRA in Europe he had noted that whilst this disease was endemic in most countries on that continent, though perhaps with less striking epidemics than we had experienced, there was not the excessive public concern about it which had developed here. In conclusion he described one treatment which had come to his attention in Central Europe, namely that of auto-inoculation with cerebro-spinal fluid, but its value had not been assessed.

Ontario Branch Canadian Cancer Society

The Annual Meeting of the Ontario Branch of the Canadian Cancer Society will be held at the Head Office of the Society, 280 Bloor Street West, Toronto, Ont., on Friday, February 14, 1947, at the hour of 8.00 o'clock in the evening for the purpose of receiving reports, and the transaction of such other business as may properly be brought before the Meeting.

ISABEL OLIVER, *Secretary*

The Physiological Society of the University of Toronto

Professor R. A. Peters, head of the Department of Biochemistry, Oxford, spoke before the Physiological Society of the University of Toronto on the subject "British anti-lewisite" on December 2, 1946. The account could be given as the subject has now been released from security controls.

Professor Peters showed how a deficiency of thiamin produces a defect in the enzyme system which is concerned with the oxidation of pyruvic acid. The latter substance is formed in the metabolism of carbohydrates and other substances and accumulates in the blood and tissues in thiamin deficiency. Lewisite and other arsenicals attack the enzyme system by combining with essential components of it, thus producing a lesion analogous to the "biochemical lesion" produced in thiamin deficiency. Investigations on the nature of the compounds which arsenical agents form with proteins provided the clues as to compounds which could possibly be of therapeutic value. This eventually led to the discovery of the antidotal action of the compound 2, 3-dimercaptopropanol which later became known as British anti-lewisite (BAL). Examples of the efficacy of BAL in treating lewisite lesions were given. BAL has proved to be valuable in treating cases of arsenical poisoning and also mercury poisoning, and may have other therapeutic applications.

Dr. Peters referred repeatedly to the work of his collaborators at Oxford, namely Thompson, Stocken, Sinclair, Philpot, Whittaker, Spray, Carleton, Holiday, Ogston and Wakelin, by whose combined efforts the work was brought to a successful conclusion. Dr. C. H. Best, the Chairman, and Dr. L. Young, who proposed the vote of thanks, spoke of the great importance of the contributions made by Professor Peters and his associates.

J. CAMPBELL, *Secretary*

La société médicale des hôpitaux universitaires de Québec

Société médicale des hôpitaux universitaires de Québec vendredi, le 22 novembre 1946.

CONTRIBUTION À L'ÉTUDE DU TRAITEMENT LOCAL DE TUBERCULOSE TRACHÉO-BRONCHIQUE.—Jules Hallé.

L'auteur rapporte les observations de 21 tuberculeux pulmoniares, porteurs de localisations trachéo-bronchiques, sous traitement depuis onze mois pour leurs lésions bronchiques. Deux malades seulement ont semblé réfractaires au traitement. Le groupe majoritaire se compose de quatorze malades qui manifestent une amélioration notable de leurs vœis aériennes supérieures, vérifiée par la bronchoscopie en série. Ils accusent aussi une reprise de l'état général manifesté par l'augmentation du poids et une sensation d'euphorie indéniable. Les cinq malades qui restent, se présentent actuellement avec une disparition complète de toute lésion macroscopique. Chez quatre d'entre eux, les examens des sécrétions bronchiques prélevées sur les éponges de nettoyage ont été négatifs; chez le cinquième, ils sont positifs.

Le traitement local consiste principalement à aspirer les sécrétions avec l'aide du bronchoscope, à cautériser par la diathermo-coagulation, plus souvent par le nitrate d'argent, en solution dont le titre varie entre 5 et 30%, et à appliquer un anti-biotique de l'ordre de la pénicilline. L'auteur a associé aux cautérisations des instillations et des pulvérisations de pénicilline en solution. Il s'est inspiré du fait acquis de l'action de la pénicilline dans les bronchites chroniques non tuberculeuses que Kay et Meade ont particulièrement mis en évidence en 1945.

Grâce à l'emploi de la pénicilline, l'auteur a éliminé de la bronche, le plus grand nombre des agents pathogènes qui lui sont sensibles et qui contribuaient à l'élaboration d'une lésion secondaire pour le moins nocive. Son emploi serait déjà justifié par le seul fait que cette solution en vaut une autre, à titre d'agent fluidifiant les sécrétions bronchiques. La malade expectore plus facilement, tousse moins et réclame ce soulagement.

FRÉQUENCE DE LA TUBERCULOSE DU TYPE DE L'ADULTE CHEZ LES ENFANTS.—R. Desmeules, L. Rousseau, et Ph. Richard de l'Hôpital Laval.

Les auteurs signalent le taux élevé de la tuberculose ulcéro-caséeuse de l'enfant et de l'adolescent, dans leur milieu hospitalier alimenté par les diverses régions de la province de Québec. Il s'élevait en 1945 à 16.6%. La tuberculose parenchymateuse évolue insidieusement la plupart du temps et elle provoque des destructions pulmonaires à type cavitaire avec une latence clinique remarquable.

Elle obéit à la cure d'air et de repos dans certains cas d'excavation même chez les sujets très jeunes. A l'appui de cet énoncé, les auteurs exposent deux observations d'enfants de 20 et 23 mois, porteurs de lésions cavitaires qui ont guéri avec la méthode conservatrice quoique l'un d'eux ait présenté en même temps des lésions osseuses et amygdaliennes de nature bacillaire. Cependant, il ne faut pas craindre de prendre l'initiative d'une collapsothérapie mineure sous forme du pneumothorax ou de la phrénicectomie ou encore sous la forme associée lorsque les lésions sont stationnaires ou évolutives.

Deux observations illustrent les heureux effets de la thérapeutique associée chez une fillette de 10 ans et chez un garçon de 11 ans.

PHLÉBITE PRÉCOCE CHEZ DEUX TUBERCULEUSES. — R. Desmeules.

L'auteur souligne la fréquence de la phlébite tardive et la rareté de la phlébite précoce dans le cours de l'évolution de la tuberculose. Il accepte l'opinion de la majorité des chercheurs qui affirment que le bacille de Koch est l'agent de l'inflammation veineuse rencontrée chez les tuberculeux. Deux observations de phlébite précoce sont rapportées.

L'évolution ultérieure plutôt favorable de la tuberculose pulmonaire chez les deux malades observés, contredit l'opinion classique qui veut l'aggravation rapide des lésions suive l'apparition de la phlébite. La plupart des auteurs affirment que la phlébite précoce est bilatérale. L'auteur note que l'inflammation veineuse fut unilatérale chez les malades qui font le sujet de la communication.

ABCÈS PULMONAIRES: IMAGES PSEUDO-KYSTIQUES.—Louis Rousseau.

Observation d'une femme de 36 ans qui présenta, à la suite d'une infection puerpérale, plusieurs abcès pulmonaires dont la flore microbienne était constituée de pneumocoques, streptocoques et staphylocoques. L'évolution vers la guérison de cette suppuration se fit dans trois mois mais après, l'on constata sur plusieurs clichés radiographiques, des images annulaires ayant les caractères des kystes. Une radiographie pulmonaire tirée cinq ans plus tard ne montre plus ces cavités constatées antérieurement.

Le diagnostic entre kystes pulmonaires, bulles emphysémateuses, était discutable mais par l'évolution ultérieure, il semble que ces images correspondaient à une suppuration pulmonaire simple.

District Medical Society No. 2, Lethbridge

A meeting of the Lethbridge and district medical society was held in the Marquis Hotel, Lethbridge, on December 6, 1946. Seventy per cent of the doctors in the district were in attendance. Following dinner, business was discussed and two scientific papers presented.

Dr. F. Pilcher, of Calgary, presented a paper on "Reno-function tests". This was illustrated with

lantern slides. He emphasized several simple tests which could be carried out without difficulty by the general man, and without high cost to the patient.

Dr. Percy Sprague, of Edmonton, gave a paper on "Allergy".

Following the scientific papers, Dr. Bramley-Moore, Secretary of the Association, outlined briefly the present situation in Canada regarding prepaid medical care. He discussed, also, the possibilities of obtaining a pathologist for the City of Lethbridge.

District No. 9

District No. 9 held its second meeting in Vegreville on Wednesday, December 4, 1946. This meeting was well attended. Following a supper at the Alberta Hotel, a scientific and business program was presented in the lecture room of the nurses' home.

Dr. M. A. R. Young, of Lamont, gave a paper on "Imperforate anus". Dr. N. J. Kuzyk, of Vegreville, presented a short instructive paper on "Sternal transfusion", and Dr. J. E. Bradley, of Wainwright, a paper on "Epidemic influenza". Dr. H. C. Wallace, of Wainwright, led the discussion on Dr. Bradley's paper. Dr. Percy Sprague, of Edmonton, the guest speaker, gave a paper on "Allergy".

Following the scientific papers, Dr. Reid gave a report on the recent Board of Directors' meeting, held in Edmonton. Dr. Bramley-Moore reported on the progress being made in the drafting of a new schedule of fees, and on the question of prepaid medical services.

Light refreshments were served at the conclusion of the meeting.

MISCELLANY

The World Health Organization

The second session of the Interim Commission of the World Health Organization was held in Geneva, Switzerland, on November 4 to 13, 1946. Delegates were present from sixteen of the eighteen member nations of the Commission. The Canadian delegation consisted of Dr. T. C. Routley, General Secretary of the Canadian Medical Association, Dr. Harold Ansley of the Department of National Health, Ottawa, and Mr. J. Chapdelaine, Secretary of the Canadian Embassy in Paris.

The Honourable Brooke Claxton, Minister of National Health and Welfare, who had been in Europe attending the Paris Peace Conference, found it convenient to attend the first meeting of the Commission. He reiterated Canada's keen desire to do its full share in the development of the World Health Organization.

The main task of the Commission is the completion of the organization. According to constitution, the General Assembly is to be called within six months after the ratification of the constitution by twenty-six nations. At this session, it was reported that four nations had formally ratified the constitution, namely, the United Kingdom, China, New Zealand and Canada. The Commission was informed, however, that the matter was on the legislative agenda of a number of countries from whom ratification might be expected within the next six months. It is anticipated that the twenty-six necessary ratifications will be available by June, 1947, and that, before the end of the year, the General Assembly may be called.

Considerable discussion took place with respect to where the Assembly first should meet. Inasmuch as Brazil and China presented the resolution at San Francisco which prompted the United Nations to set up the organization, there is a good deal of support in the Commission for the first meeting to be held in Brazil. Canada seems disposed to support this invitation and hopes that the organization will meet in this country in the not too distant future.

In order that no time might be lost in getting on with essential problems, the Interim Commission agreed, upon request, to assume all of UNRRA's residual health activities in Europe as of December 1, 1946, and to take over similar functions in Asia and the Far East in March, 1947. This undertaking, involving the absorption of staff and funds of UNRRA is indeed an important one which will require much careful handling. For the coming year, the funds available to the Commission for this work in Europe amount to one and one-half million dollars. A Finance Committee of five, composed of the delegates from the United States, China, the Ukraine, Yugoslavia and Canada, was appointed to budget the fund.

It is deemed advisable that the present agencies in the international health field be integrated with the World Health Organization as speedily as possible. These include, (1) the Health Division of the former League of Nations; (2) the Office International d'Hygiene Publique in Paris and (3) the Pan-American Sanitary Bureau. These matters provided the basis for long and involved discussion. It is of interest to report that, with respect to the first two, arrangements were completed for their integration within W.H.O.—number 1, immediately, and number 2 within the next few weeks. With respect to the Pan-American Sanitary Bureau, negotiations are proceeding and it is hoped that it will become an integral part of W.H.O. in the not too distant future.

Among other subjects which called for action with the least possible delay were the narcotic problem, malaria, yellow fever and other epidemiological diseases which menace the health of the world in whole or in part. Great care was exercised in laying the ground work for the selection of experts to deal with all of these subjects.

The Commission must recommend to the first General Assembly where the World Health Organization shall establish its headquarters. Naturally, this is a matter of great importance and requires careful study. At the present time, the organization has its headquarters in New York. It was agreed that a branch office should be opened in Geneva, and as, and when, necessary in other parts of the world. After full discussion, it was decided to appoint a committee of five persons to study and recommend where the headquarters should be established. This committee consists of Mani of India (Chairman), Sousa Pascha of Egypt, Martin Boaz of Mexico, Evang of Norway and Routley of Canada.

The United Nations have authorized a vote of $1,000,000 to the organization for the year 1947. A good deal of time was taken up by the Committee on Administration and Finance, of which Canada is a member, in consideration of the budget for next year.

Other problems discussed by the Commission were medical care for devastated areas, medical education, relations with other United Nations bodies and international bodies. It was a source of satisfaction to the Canadian delegation that reference was made to the advisability of the World Health Organization enjoying friendly relations with the World Medical Association in order that the viewpoint of the doctors of the world might be secured in connection with many activities in which the World Health Organization will be engaged.

The third session of the Interim Commission will open in Geneva on Monday, March 31.

League Advocates Premarital and Prenatal Blood Testing

In establishing the case of compulsory premarital and prenatal blood testing for syphilis, the Health League of Canada points out that of approximately 265,000 births in the Dominion annually, there are about 500 reported cases of congenital cases of syphilis.

The League emphasizes that the vast majority of these cases of congenital syphilis could have been avoided through premarital and prenatal blood tests. It is emphasized that about 75% of women who bear children contracted the disease in wedlock.

So far, only four Canadian provinces—Alberta, Saskatchewan, Manitoba and P.E.I.—have compulsory premarital blood test legislation in effect, while none has compulsory prenatal examination legislation. Ontario, however, has permissive legislation in regard to prenatal blood testing. Through this enactment, every expectant mother may obtain one free medical examination on application in a prescribed form to a qualified medical practitioner.

Health Week in February

National observance of Health Week in 1947 has been set for the week beginning Sunday, February 2, it is announced by the Health League of Canada which annually sponsors the event in co-operation with departments of health and education throughout the Dominion.

National Social Hygiene Day, a feature of the week's observance will fall on the Wednesday, February 5. This is an annual international event observed in both Canada and the United States.

Medical Grading in the Army

This new system of medical grading in the Army is causing a lot of bother. The "good-enough-for-my-father" types are asking what was wrong with the old one. ("We won the war with it, didn't we?") The series of initial letters, each one neatly grading a bodily function, from feet (L) to eyes (EE—one for each eye), proves very confusing to those who can't remember whether L stands for Locomotion or Liver and S for Spleen or Stability. Our chief trouble has been naming the business of doing it all. Shall it be *pulheemising* or just plain (very plain) *pulheeming*. Neither is very euphonic, but pulheemising seems to have won. It sounds more distinguished to have been pulheemised than merely pulheemed. (The *s* is dropped by tacit agreement; there must be no suggestion of instability about the method even if there is about the subject.)

Like many other innovations this one has altered the meanings of a number of words. Thus a handsome profile no longer refers to a Barrymore physiognomy but rather to an unbroken series of 1's. The symbols largely remain a mystery to the uninitiated. A senior officer inquired whether it was the P or the U which recorded the results of his urine examination. Perhaps our saddest case was the Pioneer found waiting outside the M.I. room carrying a large envelope who, when asked his business, plaintively told us that he had "come to be pulverized"!—"In England Now", November 2, 1946.

Sex Hormones as a By-product of the Paper Pulp Industry

In the manufacture of sex hormones and certain other substances the pharmaceutical industry has hitherto employed almost exclusively cholesterin as the basic material, but this product, which is extracted from, *inter alia*, the spinal cord of calves, is at present difficult to obtain. The Swedish Pulp Company has therefore started recently the manufacture of phytosterin from Swedish pine—a product that seems to be able to replace cholesterin on a considerable scale. For the past 8 months a large-scale plant has been in successful operation at the company's sulphate mill at Ostrand, in Northern Sweden. Thus one more link has been forged in the long chain of chemical products that are obtainable out of the Swedish forests.

One of the by-products obtained in the manufacture of sulphate pulp is the so-called phytosterin group, which serves as a basic material for the manufacture of a series of useful remedial agents, among others hormones. It has long been known that the phytosterin group occurs in wood, but it is technically very difficult to obtain these products in a pure state and on a large scale. The problem has been a subject of research in the laboratories of the Swedish Pulp Company for many years, and at the beginning of last year a plant for big-scale production was started. The methods of manufacture employed have been worked out by the Company's own chemists and engineers, while the further working-up of the phytosterins into hormones and other medicaments has been done at A.-B. Pharmacia, in Stockholm, as well as by a number of major pharmaceutical firms abroad.

The phytosterins belong to the most highly refined products so far extracted from wood. The consumption of these high-grade substances is relatively limited, especially if compared with the quantities which it is technically possible to produce. Moreover, the transformation of phytosterins into hormones has proved to be an extremely involved process requiring extensive and intricate experimental researches at the pharmaceutical works. The Company expects that its one mill at Ostrand will be able to cover the requirements of the entire world for a long time to come.

CORRESPONDENCE

Transfusion in Erythroblastosis

To the Editor:

I am extremely sorry if, quite unwittingly, in my Blackader Lecture, I misrepresented Dr. Wiener's views on the prevention of sequelæ of icterus gravis by the use of Rh negative blood. My statement was based upon the following sentence from a paper by Dr. Wiener which appeared only five months before my lecture. (*Am. J. Dis. Child.*, **71**: 14, 1946.) "Incidentally the suggestion that modern transfusion therapy may serve only to save infants for a worse fate—mental deficiency—is therefore misleading; in my experience every one of approximately 20 infants cured by such treatment has developed into a perfectly normal child."

I assumed that by "modern transfusion therapy" was meant the use of Rh negative blood or possibly of washed maternal red cells, but I now gather that by this phrase Dr. Wiener meant "exsanguination transfusions with Rh negative blood". "Exsanguination transfusion" is not a modern method because to my certain knowledge it was practised at the Children's Hospital, Toronto, over twenty years ago, and I made use of washed maternal red cells during the period before adequate supplies of Rh negative blood were available. Actually in this paper Dr. Wiener never mentions the use of exsanguination transfusions. Moreover, in a subsequent paper (*Am. J. Dis. Child.*, **71**: 25, 1946) of which he is co-author, his methods of treatment are described but exsanguination transfusion is only mentioned twice thus: first, "the original plan was to perform a complete exsanguination transfusion but this plan was not carried out because of the anticipated technical difficulties"; secondly, "exsanguination transfusion . . . is a formidable procedure to carry out". The paper (*Am. J. Dis. Child.*, **68**: 317, 1944) to which Dr. Wiener refers in his letter to you as containing the suggestion of "the use of exsanguination transfusions" does so in these words: "It is theoretically possible that . . . a complete exsanguination transfusion entailing the removal of all but a small quantity of the infant's blood and its replacement by Rh negative blood at birth or as soon thereafter as possible may serve to prevent a lethal outcome", but in a footnote it is stated that an actual exsanguination transfusion was subsequently performed on a premature Mongolian idiot.

It is only in two papers published since my lecture was given that Dr. Wiener has given details of his present technique which involves the use of heparin and descriptions of two cases in which successful results were obtained as a result of exsanguination transfusion with Rh negative blood. In the first of these papers (*J. Lab. & Clin. Med.*, **31**: 1016, 1946) the method was tested on a Mongolian idiot and the conclusion reached that it is "a procedure which may be indicated in severe cases of icterus gravis". In the second paper, kindly sent to me by Dr. Wiener and which has just been published, a second successful case is described (*Bull. Adelphi Hosp.*, **5**: 2, 1946).

Even after reading this latest paper it is difficult to be sure how many times the technique has been used because the only other case discussed is described as a Mongolian idiot and may be the one to which I have just referred. Actually, therefore, I can only trace records of three cases in which Dr. Wiener used exsanguination transfusion, two of which have been published since my lecture, and I think, therefore, it is obvious that there were sound grounds for interpreting "modern transfusion therapy" in the sense that I did, but I am glad to have the opportunity of giving a more complete account of Dr. Wiener's views as expressed in his publications.

It seems to me, however, that in his letter Dr. Wiener makes in effect the same statement as the one I attributed to him since he says, "By exsanguination transfusion kernicterus can be prevented provided that this is carried out early enough". Apart from the fact that failure to prevent kernicterus in any given patient could be said to be due to the fact that exsanguination transfusion was not carried out early enough. I produced evidence in my lecture which I thought, and still think, proved my thesis that the changes in the liver and brain which precede the bile-staining of the brain cells (kernicterus) are initiated before birth, although they may increase after birth. They therefore cannot be prevented by treatment even if this is initiated immediately after birth. In my experience of over 250 cases, kernicterus and its sequelæ—extra-pyramidal rigidity, mental deficiency, etc.—have not been diminished by the use of Rh negative blood even when, on rare occasions, exsanguination transfusion with Rh negative blood has been performed.

I would like to discuss the pathogenesis of kernicterus but this letter is already too long; later, however, Dr. Baar and I hope to write an article giving our views on this problem.

LEONARD G. PARSONS

58 Calthorpe Road, Five Ways,
Birmingham, 15.

A Suggestion Re Herniorraphy

To the Editor:

A few years ago I had the unpleasant experience of having to take apart a perfectly good repair of a large inguinal hernia to repair a small femoral hernia which was first noticed shortly after the repair of the inguinal hernia. I had a rather guilty feeling that it might have been present at the time of the other operation and decided that I would not be caught again. Accordingly at each subsequent hernia operation, after the sac was isolated and opened, I would pass my finger in through the sac and palpate the femoral canal from within. It is very easy to feel both femoral rings in that way.

About a year ago, when engaged in repairing another large inguinal hernia, in doing this check-up, the finger could be passed well through the femoral canal. It was quite a simple matter to bring up the femoral sac and repair both defects at the same time.

I have not seen any reference to this idea in reading the ordinary clinical journals and pass it along for the benefit of others engaged in this work. If it has already been described it will bear repetition.

R. B. HARE

132 Norfolk St.,
Simcoe, Ont.

Methods of Testing Hearing

To the Editor:

My paper on "Practical methods of testing hearing, etc.", published in the *Canad. M. A. J.* of December, 1946, made a claim to originality in use of the 4-A audiometer which I regret to report is not correct.

Stacy R. Guild has informed me today that the said method has been in use in the Otological Laboratory of the Johns Hopkins Hospital since 1928 and that the late C. C. Bunch also used the same method.

D. E. S. WISHART

170 St. George St.,
Toronto 5, Ont.

A Code Word for Rating Patients

To the Editor:

Referring to the article in the November issue on "Rating" by Drs. Willis and Kalant, I would like to suggest as the code word "PULHEMSTARKINGOD".

It would seem to me that a meaningless word would be preferable and that with this suggested word there is retained the seven letters with which we are all familiar. In addition the "M"—Mentality is retained and not grouped under the "N"—Neurological. The remaining portion of the word—tarkingod—is really only a sub-division of the "P".

RATING (PULHEMSTARKINGOD)

P. — Physique as a constitutional unit
U. — Upper limb and upper back
L. — Lower limb and lower back
H. — Hearing and ears
E. — Eyes and vision
M. — Mentality
S. — Stability, emotional
T. — Teeth
A. — Arterial system including the heart
R. — Respiratory
K. — Kidneys, the G-U system
I. — Intestine, the G-I tract
N. — Neurological system
G. — Glandular system, internal and external secretion
O. — Hæmopoietic and lymphatic systems
D. — Dermatological system, skin, hairs, nails

Grade 1, fit; grade 2, mild disability; grade 3, moderate disability; grade 4, marked disability; grade 5, unfit.

The same system of grading would be followed. A further refinement could be made when the defects present are of a remedial nature. In these cases, in place of using the cardinal number, one of the first five letters of the alphabet would be used instead. Thus, a hernia, which would ordinarily be classified as 3, by this system would be classified as "C".

This is merely submitted for discussion in the hopes that some acceptable form of rating will crystallize out of the discussion. I do believe that when such a system is used, it will be of great value in classifying men in their pre-placement examination for industrial occupations.

AUSTIN EVANS

December 23, 1946,
309 Avenue Road, Toronto 5.

Medical Journals for Czecho-Slovakia

To the Editor:

If at all possible, would you be so kind as to send as many issues as you have to spare—of your *Journal*—to:

Univerzitny Profesor M. V. Dr. Karol Matulay,
Psychiatricka Klinika,
Lekárska Fakulta,
Slovakian University,
Bratislava, Czecho-Slovakia.

As a Slovakian friend of mine, Dr. Matulay recently wrote to tell me how tragically short of medical literature, supplies and equipment his suffering Slovak

people were! Besides his native Slovak, Dr. Matulay speaks English and French, as well as a number of other languages, quite well. I am sure that he will appreciate any aid you may give him, to help his beloved Slovakian nation.

(MR.) FERO ZEMAN

307-12th St. "C" North,
Lethbridge, Alta.

N.B.—Slovakians are not Czechs, as Czechs are not Slovakians. The language of Slovakians is Slovak not Czech, nor Hungarian.

[*We pass on this appeal to our readers. Any such gifts of journals should be sent direct to the address given.*—EDITOR.]

SPECIAL CORRESPONDENCE

The London Letter

(*From our own correspondent*)

THE PLEBISCITE

The New Year opens inauspiciously for the medical profession. No one feels really happy about the result of the postal ballot of the doctors of the country on the question of negotiating with the Minister of Health over the carrying into effect of the National Health Service Act. The striking feature of the ballot is that 81% of civilian doctors should have participated; of these 54% voted against negotiations. An analysis of the figures shows that 56% of general practitioners voted against negotiations, whilst in the case of whole-time members of voluntary hospital staffs, whole-time teachers and whole-time research workers only 41% voted "no". In other words, it is the general practitioners who have come out most strongly in opposition to the new Act.

The Council of the B.M.A. has taken immediate action and is submitting a resolution to a special meeting of the Representative Body to be held on January 28, to the effect that the Minister of Health should be informed that the Negotiating Committee is unable to enter into negotiations with him on the Regulations to be made under the Act.

Whatever the upshot of it all may be, one fact stands out clearly above everything else: that Parliament has decreed that the new service should come into force—and by a definite date. Whether the country may ultimately regret the decree of its elected representatives is another matter that, at the moment, is only of theoretical interest. The Minister must carry out the mandate of Westminster, and, if the B.M.A. will not assist him in his task, then he will be compelled to turn elsewhere for his advisers.

THE GOLDEN AGE OF CERTIFICATES

Possibly one of the considerations that have led many family doctors to vote against negotiations with the Minister is the orgy of certificate signing in which they have been plunged since 1939. Certainly one must have considerable sympathy with them in the amount of time they have to devote to this soul-destroying "pastime". Things have indeed come to a strange pass when, as recorded recently in the *British Medical Journal*, a father wanting to buy a tricycle for his small son, is informed by the shop assistant that he could only have it on production of a medical certificate!

This legacy of the war is still with us, and, as the *British Medical Journal* points out, there is a tendency on the part of shopkeepers to demand medical certificates for articles, such as vacuum flasks, that are in short supply. When it is realized that medical certificates are required officially for priority supplies of milk, eggs and soap; special adjustments of food rations; surgical corsets; extra fuel for invalids, and extra petrol for invalids, it is not difficult to appreciate the general practitioner's reluctance to favour any step that may plunge him deeper into the mire of certification. Officialdom may adore certificates, but it is to be hoped that, whatever the shape of things to come may be, the doctor of the future may be left a few moments in the day in which he can practise the gentle art of medicine.

THE "BRITISH MEDICAL JOURNAL"

The resignation of Dr. Gerald Horner from the editorship of the *British Medical Journal*, which took effect at the end of December, brings to an end an association that has lasted for practically thirty years. Entering medical journalism as assistant editor to *The Lancet* in 1911, Dr. Horner joined the staff of the *British Medical Journal* after the 1914-18 war, and in 1928 he succeeded Sir Dawson Williams as editor. During the next ten years the journal went from strength to strength. An already high standard was enhanced and at the same time the format of the journal was progressively improved. It is no easy task to be editor of a journal which is both a scientific journal and the official publication of an association, but these two interests Dr. Horner co-ordinated with consummate skill. Then came the outbreak of war in 1939, with all its difficulties and complications; but once again Dr. Horner rose to the occasion and, in spite of drastic paper restrictions, shortage of staff and all those hazards of war to which London was exposed, he continued to bring out every week, with unfailing regularity, a journal of which he had every reason to be proud.

He carries into his retirement the best wishes of thousands scattered throughout the Empire. No one has done more to maintain those high standards of which English journalism is so rightly proud. He is succeeded in the editorial chair by Dr. Hugh Clegg, who has been deputy editor since 1934.

THE BRITISH EMPIRE CANCER CAMPAIGN

The Twenty-third Annual Report of the British Empire Cancer Campaign, covering 1946, which has just been published, is a striking commentary upon the progress in research that has been maintained in spite of all the difficulties of this post-war era. Unfortunately it has not been possible to include contributions from affiliated organizations, such as the Canadian Cancer Society, but it is hoped to be able to include these in next year's report. The field that has been covered is a wide one, including both scientific and clinical research.

One of the most impressive advances is that in the field of nuclear physics as applied to cancer research. Reports are included of two such investigations, one using radio-sulphur and the other using radio-phosphorus. In the clinical sphere, the most outstanding item is the report indicating that the results of radium therapy in the treatment of cancer of the uterine body now compare favourably with those of operative removal. The volume of research work on cancer is now such that it has been found necessary to undertake the publication of a special quarterly journal, and the hope is expressed in the Report that the first issue of the new *British Journal of Cancer* will be published in the Spring.

WILLIAM A. R. THOMSON

London, January, 1947.

The Holland Letter

(*From our own correspondent in Holland*)

GREAT MEDICAL CONGRESS AT AMSTERDAM

During the second half of September a great congress for public health was held at Amsterdam; 1,200 delegates, physicians, social workers, officials, nurses attended the different meetings as representatives of their unions, and discussed the influence of the war on the development of public health.

Princess Juliana opened the congress with a speech in which she remarked that physical and moral health had suffered greatly by the war and the German occupation. It will be a great but difficult task for

the congress and for all, concerned with public health, to find the means and ways to better public health and give the Dutch people more happiness, said the Princess. Especially in the former colonies physicians and nurses are necessary in view of the bad health conditions of the population.

Dr. L. C. Kersbergen, secretary of the congress, made a speech in which he gave a summary of public health before, during and after the war. He related the period of famine during the winter of 1944-45. In February, 1945, only 340 calories were given daily, a number decreased since October, 1944, when the food ration contained only 1,500 calories. For 22 weeks the Dutch population received 590 calories daily.

General and infantile mortality before the war, the lowest of the whole world, increased considerably during the occupation. Tuberculosis increased by 90%. General mortality in the winter of 1944-45 by more than 200%. The number of men, who died during the period of famine was three times the number of women.

Venereal diseases, tuberculosis, infectious diseases like malaria are now frequently found amongst the Dutch population. Dr. Kersbergen proposed that the whole Dutch population should be examined radiologically, as being the only way to find out all cases of tuberculosis.

The Minister of Social Affairs, W. Drees, whose department is charged with public health, told the meeting that the government had bought during and after the war all the medicaments and instruments, she could find in foreign countries. He related the help offered to the Dutch population, after the liberation, by the Canadian, English and American authorities of the army and civil affairs. General mortality is now decreasing, although figures are not as good as before the war. The birth rate is decreasing.

Fifty-nine orators discussed in several committees problems such as eugenics, food and rationing, help for victims of war and deported people, problems of moral insanity, antenatal and prenatal care, etc.

Dr. H. P. J. Koenen discussed the questions of the academic education of physicians. More general philisophy and psychology is wanted in the teaching of students. More courses for graduate physicians are necessary than are now available. For nurses a better salary is wanted, especially for district nurses. General propaganda in the families will do much to help the doctor and the nurse in their work for better social and hygienic conditions.

An exhibition is now held in Amsterdam, where tables, figures and photographs give an idea of the development of public health in Holland during the last years. The delegates of the congress assisted at the opening of this exposition.

HOUSING POLITICS IN HOLLAND

The Dutch government has published a plan for reconstruction and house-building. It will be 1958 before housing conditions are equal than those of 1939, under condition that 70,000 houses are built yearly. Unfortunately this year about 10,000 houses only can be built, because material is not available in sufficient quantities.

DEVELOPMENT OF THE DUTCH POPULATION AFTER THE WAR

The Dutch population amounted to 9,298,889 on January 1, 1946, *e.g.*, 279 per square kilometer. The birth rate was 22 per 1,000 inhabitants in January, 1946, (during 1936 to 1939 only 20.1 per 1,000 inhabitants) of the months January till Junevbgkqj).-shrdlucmfwyp increasing to 33.1 in June, 1946.

Mortality decreased, amounting to 9.9 per 1,000 inhabitants in the course of the months January to June, 1946 (during 1936 to 1939 mortality was even lower, 9.7 per 1,000 inhabitants).

Though figures for general mortality and infantile mortality (45.5 in the period of January to June, 1946, against 43.9 in 1936 to 1939) were better before the war, it appears that the bad influence of the war on public health is now going to disappear. J. Z. BARUCH
Amsterdam - Z.

CANADIAN MEDICAL WAR SERVICES

MEDICAL OFFICERS STRUCK OFF STRENGTH OF THE R.C.A.M.C.—ACTIVE FORCE NOVEMBER 1946

(Previous sections in January, March, April, May, June, July, September, October, November and December, 1945 and January, March, May, June, July, August, September, October, November and December, 1946 and January, 1947.)

SECTION LXXXVII

Name	*Address*	*Date struck off strength*
Baillargeon, T. L.,	10 St. Denis St., Quebec	5-10-46
Bain, H. W.,	176 Copeland St. North Bay, Ont.	25-10-46
Barton, H. G.,	Schreiber, Ont.	30-9-46
Blais, R.,	3 Church St., Quebec	12-9-46
Bookhalter, E. M.,	232 Aberdeen Ave., Winnipeg	5-10-46
Bremner, R. M.,	37 Glenwood Ave., Toronto	2-10-46
Brook, M. H.,	408 McMillan Bldg., Saskatoon	7-10-46
Burleigh, H. C.,	Bath, Ont.	24-4-46
Cameron, C. G.,	104 Pine Crest Rd., Toronto	31-8-46
Clute, K. F.,	5 Admiral Rd., Toronto	23-9-46
Cockburn, D. W.,	5 Second Ave., Ottawa	10-10-46
Cusson, A. H.,	5913 rue Chabot, Montreal	26-8-46
Davis, F. H.,	Royal Trust Bldg., Vancouver	17-10-46
Donahoe, J. E.,	968 Moffat Ave., Verdun, Que.	23-9-46
Downs, W. J.,	1301 6th St., N.W. Calgary	15-8-46
Eckert, L. A.,	398 Huron St., Toronto	1-10-46
Ewert, E. L.,	356 Brock St., Kingston, Ont.	16-10-46
Forsberg, A.,	841 Millwood Rd., Toronto	25-10-46
Fraser, R. H.,	1788 Bayswater St., Vancouver	1-10-46
Freeman, V. J.,	1235 W. 26th Ave., Vancouver	23-9-46
Hennigar, G. R.,	154 Cobourg Rd., Halifax	19-10-46
Homik, A. M.,	Canora, Sask.	4-10-46
Hoover, M. P.,	76 John St., Weston, Ont.	15-6-46
Johnston, H. C.,	432 Daly Ave., Ottawa	3-9-46
Johnston, R. J.,	10964-84th Ave., Edmonton	3-10-46
Jolly, R. D.,	63 Hocken Ave., Toronto	30-9-46
Jones, G. W.,	1383 W. 32nd Ave., Vancouver	23-10-46
Key, C.,	10956-84th Ave., Edmonton	9-10-46
King, P. A. H.,	Victoria	15-2-45
Lamquin, R. J.,	Hotel Dieu Hospital, Montreal	9-10-46
Leach, J. E. K.,	Manotick, Ont.	28-10-46
Lebel, G. A.,	13 Blvd. des Allies, Quebec	2-10-46
Leclaire, Y.,	191 Maplewood Ave., Outremont, Que.	1-10-46
Levitt, H.,	78 St. Patrick St., Toronto	24-10-46
Ludwig, B. L.,	225 Grace St., Toronto	18-10-46
Lynch, E. L.,	Matapedia, Que.	7-10-46
Lynn, R. B.,	318 University Ave., Kingston, Ont.	12-9-46
Mckendry, J. B. R.,	Winchester, Ont.	3-10-46

Name	*Address*	*Date struck off strength*
MacPherson, R. H.,	325 Mountain Rd., Moncton, N.B.	30-9-46
Melnyk, D.,	11321-81st St., Edmonton	3-10-46
Menzies, M. A.,	5463 Vine St., Vancouver	18-9-46
Miller, W. R. A.,	47 Regal Blvd., Toronto	19-10-46
Milne, M. N.,	785 Queen St. W., Toronto	17-10-46
Mooney, J. K.,	Peakes, P.E.I.	8-10-46
Moss, G. W. O.,	374 Glebeholme Blvd., Toronto	16-10-46
Muldorfsky, R.,	123 Beatrice St., Toronto	28-9-46
Myers, H. A.,	805-8th Ave., Calgary	10-10-46
Neil, R. B.,	10715 Saskatchewan Drive, Edmonton	12-8-46
Nolin, G. H.,	Val Brillant, Matapedia, Que.	13-9-46
Oberwarth, U. E.,	Women's General Hospital, Montreal	19-10-46
O'Neill, J.,	Font de Quebec, Que.	20-9-46
Page, N. A.,	77 Clifton Rd., Toronto	16-10-46
Parrott, J. E. R.,	26 Osborne Ave., Toronto	2-10-46
Polson, R. A.,	661 Riverwood Ave., Fort Garry, Manitoba	2-10-46
Prowse, W. C.,	Taber, Alta.	1-10-46
Pugh, D. S.,	Kingston, Ont.	12-10-46
Reich, C. J.,	Prince Rupert, B.C.	15-10-46
Roy, D. G.,	1535 W. 12th Ave., Vancouver	9-10-46
Rubin, I. C.,	4343 St. Urbain, Montreal	26-9-46
Rublack, A. E.,	93 Myrtle Ave., Yorktown, Sask.	9-10-46
Schapira, M.,	Borden, P.E.I.	13-9-46
Shulhan, M.,	Dundurn, Sask.	10-10-46
Sinclair, A. B.,	444 Albert St., Sault Ste. Marie, Ont.	10-7-46
Smith, A. O. C.,	22 Bowood Ave., Toronto	16-10-46
Stanfield, H.,	11009-88th Ave., Edmonton	4-10-46
Stanford, R. L.,	319 Redfern Ave., Montreal	11-10-46
Stein, A. A.,	226 Niagara St., Toronto	1-10-46
Stewart, H. L.,	Belle River, P.E.I.	27-9-46
Stillman, A. T.,	371 Markham St., Toronto	16-10-46
Stillwell, G. K.,	2150 Retallack St., Regina	24-10-46
Swartz, M. J.,	Box 169, Cranbrook, B.C.	13-9-46
Tanguay, F.,	23 Bowen Ave., Sherbrooke, Que.	3-10-46
Vallee, J. L. J. St. R.,	1143½ St. Vallier St., Quebec	24-10-46
Vipond, C. H.,	172 Wellington, Kingston, Ont.	22-10-46
Wachs, H. M.,	Montreal	15-10-46
Wall, M. B.,	437 College Ave., Winnipeg	2-8-46
Watts, G. O.,	Toronto General Hospital, Toronto	25-9-46
Weingarten, M. H.,	9 Rolyat St., Toronto	23-10-46
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ABSTRACTS FROM CURRENT LITERATURE

Medicine

The Treatment of Hyperthyroidism with Radioactive Iodine. Chapman, E. M. and Evans, R. D.: *J. Am. M. Ass.*, **131**: 86, 1946.

Since the discovery of induced radioactivity in 1934, radioactive isotopes have been used extensively in physiological experiments especially in investigating metabolic problems. The possibilities of their use as therapeutic agents are just beginning to be explored. This article reports on the results of treatment of 22 patients with hyperthyroidism using radioiodine. The work was carried out by the Thyroid Clinic of the Massachusetts General Hospital in collaboration with the radioactivity centre of the Department of Physics of the Massachusetts Institute of Technology. This collaboration is a reflection of the increasing complexity of medical research.

The radioiodine used was prepared by deuteron bombardment of metallic tellurium in a cyclotron. This was given to the patient by mouth, in a sodium iodide solution containing both the 12-hour and 8 day isotopes. The dose varied between 14 and 79 millicuries. The method of calculating the tissue dose in roentgens is elaborated, and it is shown that 90% of the total radiation is delivered within the first 36 hours after administration. A dose of 14 millicuries results in 3,160 roentgens being delivered to the thyroid in the first 36 hours. Urinary excretion studies of radioactive iodine were made to estimate the efficiency of radiation.

Of the 22 patients, 14 responded well to a single dose of radioiodine: three were given 2 doses and five received 3 doses. In 16 cases, thyrotoxicosis was well controlled; 2 remained mildly thyrotoxic while 4 developed signs of myxœdema. The radioiodine produced transient radiation sickness in 6 patients. Subsequent biopsy of two cases showed fibrosis of the gland. The authors note that patients who have not responded well to other forms of treatment (thyroidectomy and iodine administration) responded well to radioiodine.

The authors conclude that "we believe that therapy with radioactive iodine can be added to the growing list of medical methods for the control of thyrotoxicosis". The article should be read in its entirety by all those concerned with thyroid disease. DOUGLAS FINDLAY

Sudden Death in Rheumatic Fever. Griffith, G. C. and Huntington, R. W.: *Ann. Int. Med.*, **25**: 283, 1946.

Over a period of 18 months at the Rheumatic Fever Unit of the U.S. Naval Hospital, Corona, California, 7,165 rheumatic fever patients were observed and among these patients 13 deaths occurred of which 3 were instances of sudden death in the course of mild rheumatic fever in men aged 28, 22, and 26 years.

Case 1 was convalescent from rheumatic fever. The only cardiac abnormality was a faint apical systolic murmur heard first in the 7th month of convalescence. During the 9th month following tonsillectomy under novocaine, patient walked back to the ward feeling well, and one hour later suddenly became pale, cyanotic, pulseless and died. The main pathological findings were: base of aorta greatly thickened: both coronary arteries and main branches were greatly thickened and lumen appeared almost occluded. Microscopically, there was an accumulation of relatively homogeneous extracellular material in the coronary arteries and at the base of the aorta, located largely intramurally. Aggregates of large Aschoff-like cells were noted in some areas.

Case 2 did not have clinically active rheumatic fever but had been returned from a period of strenuous combat duty following the finding of aortic systolic and slight aortic diastolic murmurs. While under observation, he suddenly fell out of a canoe in which he was paddling and, though known to be a strong swimmer, he sank to the bottom immediately. Tricuspid leaflets were fused and retracted: mitral leaflets were greatly thickened, fused and the free edge was hard: aortic cups were thickened and curled. There was a soft discoloured area in the anterior wall of the heart, and the anterior descending branch leading into the area appeared occluded by œdema of the arterial wall. Microscopically there was considerable focal œdema in the coronary arteries: aorta showed marked cellular accumulation.

Case 3 had active rheumatic fever with recurrent precordial pain and constantly changing T wave pattern. Eight hours before sudden death, the precordial pain greatly increased. The left coronary was very much narrowed by an atheromatous plaque near its origin: its descending branch appeared obliterated by a soft mass: left ventricular wall showed areas of fibrosis suggesting old myocardial infarcts. Microscopically, myocardium was thickly strewn with Aschoff bodies: coronary changes were similar to those in case 1.

It is felt that a rheumatic diagnosis is justifiable in these cases, particularly in view of the valvular changes in case 2 and the myocardial cell groups in case 3. It is suggested that the sudden death is due to an acute anaphylactic coronary angiitis superimposed upon a low-grade rheumatic carditis. A. L. JOHNSON

Methæmoglobinæmia: Treatment with Ascorbic Acid. Carnrick, Lieut. M., M.C., U.S.A. and Klein, T.: *Arch. Int. Med.*, **78:** 296, 1946.

Where cyanosis cannot be explained by cardiac or pulmonary disease, it may be due to an increased concentration of methæmoglobin. The possibility of the presence of this derivative in the blood should always be kept in mind. Sometimes a spontaneous formation occurs, so that an examination of the blood for this should always be done where the cause of the cyanosis has not been certified. This condition is frequently accompanied by gastro-intestinal disturbances—such as long standing diarrhœa.

The response to treatment of methæmoglobinæmia with ascorbic acid is very striking: all clinical symptoms disappear quickly. Administration can be by vein if emergency demands.

Patients suffering from this disease may come into hospital complaining of pain in the abdomen, diarrhœa and vomiting. Their temperature may be moderately elevated, they may have a loss of vision in one or both eyes. It has been suggested that toxic products in the intestines might be absorbed and produce the above condition. A level of 3 grams of methæmoglobin per 100 c.c. of blood will produce symptoms.

Methylthionine chloride has had some success in the treatment, partly by chemical changes produced in the blood, partly by stimulation of the respiratory centre. Ascorbic acid is much better. P. M. MACDONNELL

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In the case reported here there was a history of contact, a positive tuberculin test, and hilar gland enlargement. Examination of the cerebrospinal fluid gave the characteristic chemical and cytological findings, and smears on admission showed acid fast bacilli. Guinea pig inoculation however was negative for tuberculosis. Unfortunately the animal was not inoculated until two days after streptomycin therapy was started. It is conceivable that enough of the drug was in the spinal fluid to inhibit the growth of the organism in the guinea pig. This action of streptomycin in the guinea pig was demonstrated by Feldman, Henshaw and Mann. Treatment was continued for 57 days and a total of 24,000,000 units of streptomycin was given intramuscularly, and 2,800,000 intrathecally (65 taps).

Five months after the onset the patient was clinically well but showed a pleocytosis of 140 cells, mostly lymphocytes. He was said to be active and mentally normal. PRESTON ROBB

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Subacute bacterial endocarditis should be treated by one million or more units of penicillin daily continued for an adequate period. Such therapy has resulted in apparent cure of the last 15 cases treated in this series, none of whom received anticoagulants.

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Fistulæ over the masseter would appear to be the commonest. Recent laceration should be sutured at once, using the technique described below. Chronic fistulæ should be treated surgically. Operations using flaps of mucous membrane to create a new duct are unnecessarily complicated and involved. Fistulæ anterior to the masseter are rare. It is essential that the papilla be preserved, because of its protective action, in any attempt at repair.

Preoperative routine includes (*a*) lipiodol injection into the fistula followed by radiography, (*b*) daily dilation of the oral opening for about ten days, (*c*) 25,000 units of penicillin intramuscularly every 3 hours beginning 24 hours after operation.

Intratracheal anæsthesia is ideal. At operation the papilla is dilated. A flexible probe is inserted as far as possible. A second probe is introduced through the fistula and pushed anteriorly as far as possible. An incision is made through the cheek, using the ends of the probes as landmarks. Branches of the 7th nerve should be avoided. By manipulation, or by excision of scar, the two ends are approximated. No. 10 twisted tantalum wire is pulled from the fistula, along the duct, until it presents in the mouth. The proximal end of the twisted wire is inserted into the proximal portion of the duct. The fistula and wire are carefully closed with fine catgut, as many layers of covering as possible. The distal end of the wire is brought out the mouth and fastened to cheek with adhesive or a stitch. It is moved slightly back and forth daily.

Postoperative care consists in (*a*) continuing the penicillin, (*b*) pilocarpine hydrochloride, 10 mgm. three times daily, is started the day after operation (*c*) 1 gm. of ammonium chloride is given with each meal for 3 days, (*d*) and a minimum of 3,000 c.c. of fluids daily, taken with meals, is advised. Oral hygienic measures are most important. If necessary, the oral papilla should be dilated daily. It is not unusual to have the fistula reopen for a short period. If the wire is still present the fistula will close. The wire should be held in position for at least three weeks. All fistulæ operated upon by the authors, using this technique, were successfully closed. STUART GORDON

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Amputation with refrigeration and tourniquet in the elderly, toxic patient with gangrene and sepsis gives excellent results. Pain and shock are eliminated. No other method so successfully does this.

Details of the method used by the authors are given. A skin temperature between eight and ten degrees centigrade is desirable. Two turns of one centimetre rubber tubing is recommended for the tourniquet. Ice bags are applied for twenty minutes before the tourniquet is applied. Shaved ice is packed within a rubber sheet about the limb. After two and one half to three hours, the patient is ready for operation. The only sedative used is one ounce of whiskey.

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The cases that were not relieved were shown at operation to be acute cholecystitis without stone. Papaverine is considered the second best drug to use in biliary colic. Aminophyllin is not useful for the relief of postoperative pain. It is suggested that the surgeon use aminophyllin directly into the cystic or common ducts following an operation for stones in the gall bladder.

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The blood supply from the deep palmar arch to the index finger must be carefully preserved. The requirements for the thumb substitute are that it must abduct, oppose, flex, and touch the other finger tips. It must have sensation at least to distinguish between heat and cold and have some awareness of shape and position.

The second metacarpal is separated laterally from the hand at its distal end and a new web formed from a full thickness flap from the abdomen. It is then sectioned near its base and gradually rotated into position

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Functional Restoration of the Thumb. Kelikian, H. and Bintcliffe, E. W.: *Surg., Gyn. & Obst.*, **83:** 807, 1946.

The loss of the thumb deprives the hand of most of its usefulness; grasp, torque, and apposition are lost, with all the disabilities that this implies. Two cases of loss of thumb, both with coincidental injury to the hand due to war wounds are detailed. In one case the corresponding metacarpal was also lost. In both, the situation was met by pollicization of the index finger.

The blood supply from the deep palmar arch to the index finger must be carefully preserved. The requirements for the thumb substitute are that it must abduct, oppose, flex, and touch the other finger tips. It must have sensation at least to distinguish between heat and cold and have some awareness of shape and position.

The second metacarpal is separated laterally from the hand at its distal end and a new web formed from a full thickness flap from the abdomen. It is then sectioned near its base and gradually rotated into position

so that too great a strain is not imposed on its vascular and nerve supply. The long abductor of the thumb is attached to this metacarpal; a sort of a ball and pin joint is made by coning the proximal end of the sectioned metacarpal and excavating a cavity for its reception in the greater multangular; the relationship of the two bones is maintained by wiring them together. All function possible is encouraged during the entire treatment. L. T. BARCLAY

Combined Jaw Resection Neck Dissection for Metastatic Carcinoma of Cervical Lymph Nodes Secondarily Involving the Mandible. Sugarbaker, E. D. and Gilford, J.: *Surg., Gyn. & Obst.*, **83:** 767, 1946.

"It is now generally conceded that the preferred treatment of carcinoma in cervical lymph nodes, metastatic from tumours of the oral cavity, excepting that derived from the undifferentiated cancers found chiefly at the base of the tongue, tonsil, nasopharynx and extrinsic larynx, is radical surgical removal." Contraindications to lymph node dissection are uncontrollable primary, distant metastases, and such poor general condition of the patient as to make risk of operation outweigh what can reasonably be expected in survival.

Other considerations have to do with the extent of the disease in the neck: whether unilateral or bilateral, whether confined to the upper cervical glands or involving also the lower nodes of the chain, and whether or not the gland capsules have been penetrated. Fixation of secondary deposits to the mandible is not a contraindication to operation for the mandible may be resected.

This series consists of twelve cases. Details of preoperative and postoperative care are dealt with, also the operation is detailed and may be in two stages in poor-risk cases with resection of the jaw followed later by neck dissection. Tracheotomy is routine. Prècis of all cases are presented. Seven patients are well without uncontrolled recurrence in the period of observation. Two operative deaths occurred and two patients died of intercurrent disease without recurrence. Most of these cases were associated with carcinoma of the lip.

L. T. BARCLAY

Obstetrics and Gynæcology

Complications and Fetal Mortality in 136 Cases of Multiple Pregnancy. Munnell, W. E. and Taylor, H. C.: *Am. J. Obst. & Gyn.*, **52:** 588, 1946.

In 136 cases of multiple pregnancy delivered in ten years on the Bellevue Obstetrical Service, the gross fetal mortality was four times greater than the gross fetal mortality for all deliveries during the same period. The corrected fetal mortality for twins was almost twice as great as the ten-year average for all deliveries. Prematurity was the outstanding cause for the greatly increased fetal mortality in multiple pregnancy. Only 53% of the multiple pregnancies were carried beyond 36 weeks of gestation. The average birth weight was 4 lb. 7½ oz.

The order of frequency of various possible combinations of presentations has been presented. There was no appreciable effect upon the duration of labour. The toxæmias of pregnancy, polyhydramnion, uterine inertia, prolapse of the umbilical cord, and postpartum hæmorrhage were much more frequently encountered in multiple pregnancy. The method of delivery of either twin was of secondary importance to the factor of prematurity insofar as fetal mortality was concerned. Fetal mortality was higher on the second twin when delivered by an operative procedure. The second twin, therefore, should be allowed about twenty minutes for spontaneous delivery, unless bleeding, evidence of fetal distress or maternal complications necessitate immediate intervention. It would not appear advantageous to wait longer than twenty minutes. Prematurity should not be considered an indication for forceps delivery of the second twin. ROSS MITCHELL

Penicillin in Treatment of Acute Puerperal Mastitis. Taylor, M. D. and Way, S.: *Brit. M. J.*, **2:** 731, 1946.

The criteria for starting treatment are pyrexia, associated with flushing, and hardening of the breast. Emptying of the breast may be obtained preferably by allowing the child to feed. Adequate control of the infection can be attained only by the systematic administration of large doses of penicillin, *e.g.*, 3-hourly intramuscular injections of 12,000 to 20,000 Oxford units.

Ten cares are reported. There was quick resolution, with no prolonged disorganization of the breast; in only one instance did suppuration occur, and this was treated with closed aspiration. Lactation was not interfered with and breast-feeding was maintained in all but one case. The total period of disability was not longer than 7 days and discomfort was never present for more than 3 days. No baby became infected as a result of the continued suckling. The treatment seems worthy of extended trial. ROSS MITCHELL

Endometriosis in Association with Pregnancy. Lock, F. R. and Myers, R. T.: *Am. J. Obst. & Gyn.*, **52:** 556, 1946.

The information contained in the medical literature leads one to believe that the combination of pregnancy and endometriosis is dangerous. Two cases, however, are reported in which patients treated conservatively for endometriosis subsequently conceived and had a normal course, delivery and puerperium.

Few specific case reports of uncomplicated pregnancies in patients with endometriosis are to be found, but a careful search of the literature reveals that such cases are mentioned casually in articles which deal primarily with the gynæcologic aspects of endometriosis. An analysis of five such articles shows that approximately one-third of the patients who are treated conservatively can successfully conceive, and indicates that the vast majority of such patients have a normal pregnancy. For this reason, we wish to re-emphasize the desirability of employing procedures which conserve the childbearing function in youthful patients with endometriosis. ROSS MITCHELL

Pathology

Atherosclerosis and Arteriosclerosis in Dogs Following Ingestion of Cholesterol and Thiouracil. Steiner, A. and Kendall, F. E.: *Arch Path.*, **42:** 433, 1946.

Arterial lesions similar in distribution and morphological character to those seen in human arteriosclerosis were induced in dogs by feeding cholesterol in oil and thiouracil daily to dogs for periods of 48 to 56 weeks. Previous attempts to produce such lesions by cholesterol feedings have failed and this study was undertaken in view of the known relation of thyroid function to the level of serum cholesterol. The cholesterol content of the blood exceeded the normal by maximum values of 779, 980 and 2,000 mgm. %. A control animal, receiving thiouracil alone, and in which the cholesterol values did not exceed 500 mgm. %, showed no arterial lesions. The extent and severity of the lesions paralleled the duration and degree of the hypercholesteræmia, and ranged from intimal foam cell infiltration alone to fibrosis and hyalinization of the intima. The dog with the highest cholesterol values showed marked aortic arteriosclerosis below the diaphragm, the lesions increasing in size and severity toward and beyond the bifurcation of the aorta. Further, this animal had calcified plaques in the iliac arteries. Cerebral arteriosclerosis was not produced. Hypertrophy and hyperplasia of the thyroid gland were seen in all dogs as a result of thiouracil administration. The authors believe that, allowing for the differences in cholesterol values and life span in the two species, the conditions necessary for the production of arterial lesions are similar in both the dog and the rabbit. However, the distribution in the dog was different from that observed in the rabbit and was strikingly similar to that seen in human arteriosclerosis. It is probable that the fundamental disease

process is the same in both dogs and rabbits and that the differences in distribution and morphologic character of the lesion are due to some unidentified anatomical factor. The ability of the dog to metabolize considerable quantities of cholesterol did not prevent the development of arterial lesions after the hypercholesteræmia had been established. W. E. FINKELSTEIN

Temporal Arteritis: Report of a Case and a Comparison with Respect to Periarteritis Nodosa. Gordon, L. Z. and Thurber, D. C.: *Arch Path.*, **42:** 402, 1946.

Temporal arteritis was first reported in 1932. Since then over 40 cases have been described in the literature and the clinical and pathological picture has been enlarged. Usual symptomatology consists of severe headache and bi-temporal pain with tender areas along the course of the superficial temporal arteries. There may be associated fever, anorexia, malaise, anæmia and loss of weight. The clinical course is benign, usually ending in recovery. Clinical findings in the nature of ocular symptoms, pain in the extremities, pain in the teeth and jaws and cerebral symptoms in addition to the usual symptomatology of temporal arteritis itself, suggest that a widespread vascular involvement may occur. Autopsy findings in a number of cases indicate that the lesions may be widely distributed, since similar lesions have been found in the aorta, carotid, cerebral, innominate, subclavian, iliac and retinal vessels, in addition to the temporal arteries.

The authors describe one case of temporal arteritis, with recovery. The histological picture of the process was, in essence, a pan-arteritis with intimal proliferation, focal medial necroses bordered by giant cells and epithelioid cells, and an adventitial lymphocytic infiltration particularly around the vasa vasorum. The authors feel that differentiation between periarteritis nodosa and temporal arteritis based on the character of the cellular response is impossible. Both lesions show similar phases of destruction followed by repair, and every histological picture described in temporal arteritis can be duplicated in periarteritis nodosa. Important differences do exist, however, in the distribution of the lesions: periarteritis tends to be predominantly a "panarteritis of visceral vessels" whereas temporal arteritis is a "panarteritis of peripheral vessels". Further, the latter condition is more common in females and, to date, no case has been reported under the age of 55. Periarteritis is more frequent in young adult males. The authors surmise that the difference in distribution of these lesions may account for the difference in mortality which is higher in periarteritis nodosa, although this difference may be revised as more cases are reported.

W. E. FINKELSTEIN

Necropsies on Okinawans. Steiner, P. E.: *Arch. Path.*, **42:** 359, 1946.

Findings in 150 necropsies performed on Okinawans of all ages during the American campaign on that island are reported. Some interesting differences in pathological findings were noted in this group when compared with those that might be expected in Americans. The most striking difference was the low incidence of the retrogressive and degenerative diseases. Arteriosclerosis appeared late in life and developed to a moderate degree or not at all; further, its sequelæ in relation to brain, heart and kidney were not observed. Hypertension, heart disease and renal disease of all types were either absent or extremely uncommon. Although cirrhosis of the liver was found, disease of the extrahepatic biliary system was not noted. The low incidence of these diseases as seen in this series agreed well with the results of a questionnaire submitted to native Okinawan physicians. After studying the life of these people, the author puts forward the suggestion that two possible etiological factors in the low incidence of degenerative diseases may be (1) placid, although physically strenuous, existence, and (2) a simple, largely vegetarian diet. Malignant tumours were not noted, although benign neoplasms were not infrequent. Diseases of the endocrine glands were either non-existent or very rare; the author believes this to indicate excellent endocrine balance as is evidenced by the rarity of prostatic hyperplasia, uterine fibroids, pathological obesity, hirsutism in women, diabetes, etc. The most frequently observed causes of death were pulmonary tuberculosis of an acute, extensive, fulminating type, pneumonia and dysentery. Tetanus was a common finding in cases of combat injury. Infestation with parasitic worms was common but was rather benign insofar as clinical effects were concerned; this was also the case with filiariasis which rarely caused elephantiasis. Interesting anatomical findings in all cases were a large, long, tortuous colon with an S-shaped curvature at the hepatic flexure, possibly related to a predominantly vegetarian diet over many centuries, a very small spleen and a large, firm pink pancreas about one-third heavier than the spleen. W. E. FINKELSTEIN

Hygiene and Public Health

The Attitude of Industrial Management Toward Alcoholism. Mortenson, C.: *Quart. J. Stud. Alcohol*, p. 205, September, 1945.

Employment counsellors and foremen can be advised that alcoholism is no longer the hush-hush matter that it once was and that the temporarily incapacitated alcoholic employee should seek treatment for his ailment. That is the suggestion offered by the author in this contribution to a symposium on the problem of alcoholism in post-war planning.

Alcoholism is a personality disorder and as such is a legitimate concern of industrial management just as are other problems of health and disease in general. In the post-war period, the problem will doubtless be much greater than at present. In the opinion of the author, what to do with the alcoholic employee will depend upon the advice of our future psychiatric consultants. That efforts to rehabilitate these persons are justified is indicated by the presence on various industrial staffs of recovered alcoholics who have proved to be able and productive men. The cost of such a rehabilitation program in an industrial plant employing from 10,000 to 25,000 men and women would be approximately $15,000 per year or $30 to $60 per alcoholic.

The author is convinced that industrial management should take an active interest in this problem of alcoholism. Although he would not yet suggest the specific efforts to be made within the factory, he recommends that all possibilities within the plant be investigated. He suggests the forming of a committee representing the personnel department, the health department and the operating department. With the co-operation of a recovered alcoholic in the plant, and by consultation with psychiatrists, this committee should survey the problem as it exists in the plant, and their past experience with alcoholics. He suggests that it familiarize itself with any community resources which could be utilized and with the services rendered by national organizations such as the National Committee for Education on Alcoholism. The nature and degree of the action to be taken by any plant should then be based on the findings of their investigational committee rather than on armchair speculations. MARGARET H. WILTON

Executives' Health in Industry. Hazlett, T. L.: *Hygeia*, p. 672, September, 1946.

That industry is overlooking the health of its executives is indicated by the findings of a cardiovascular survey conducted during 1945, of 909 supervisory employees of the Westinghouse Electric Corporation. Among these persons, whose ages ranged from 20 to 72 years, it was found that the frequency of cases in whom no abnormal findings were recorded, fell rapidly with advancing years. The abnormalities found, increased greatly as the 40-year old group was reached and rose sharply above this age.

The author makes a number of suggestions and recommendations to safeguard the health interests of these supervisory employees. He stresses particularly

the importance of regular careful physical examinations and of following any recommendations of the examining physician. He discusses briefly the necessity of viewing all petty annoyances objectively and of not magnifying them, the need for executives to assign various duties to a subordinate, the values of adequate sleep and the importance of following the requirements of a normal diet.

Intelligent use of physical exercise is important. A real vacation is essential, not merely a periodic pause as provided by one days's rest in seven, but a fairly prolonged departure from accustomed scenes and routines. The hobby selected should be one that provides mental diversion. It should not add strain either to an overwrought mind or to a tired body. Moderation is advised in the use of both alcohol and tobacco.

MARGARET H. WILTON

Ophthalmology

Retrobulbar Neuritis and Complete Heartblock Caused by Digitalis Poisoning. Wagener, H. P., Smith, H. L. and Nickeson, R. W.: *Arch. Ophthalmol.*, **36:** 478, 1946.

The authors point out that whereas disturbances of vision such as coloured, frosty, snowy, or blurred vision, or flickering sensations, resulting from digitalis intoxication have been described by many investigators, no definite instance of retrobulbar neuritis caused by digitalis poisoning appears in the literature. The visual disturbances have generally been attributed to a cerebral intoxication. This paper purports to demonstrate that digitalis poisoning can effect not only the higher cerebral centres but also the papillomacular fibres of the optic nerve. Inasmuch as digitalis has a selective action on the vagus nerve, the auriculo-ventricular conduction mechanism and the sino-auricular node, it is not incorrect to postulate the possibility of direct damage to the optic nerves secondary to generalized systemic intoxication. Since digitalis is in constant and universal use, its toxic manifestations cannot be overemphasized.

A case report is included of a fifty-year-old white male, who had been on digitalis therapy for over two months because of having shown extrasystoles. His ocular complaints were blurring of vision, and a yellow discoloration of lights, grass, etc. The ophthalmoscopic examination revealed blurring of the disc-margins, and field studies showed no peripheral change; but centrally each eye had a relative scotoma of about eight degrees, with a small absolutely dense focus in the centre of each. The electrocardiogram showed, among other findings, a complete heart block. Digitalis was stopped, and fluids administered orally in increasing amounts. Within five weeks his eyes and general condition returned to normal.

Neurology

Surgical Treatment of Syringobulbia and Syringopontia. Cramer, F. J.: *Arch Neurol. Psychiat.*, **56:** 442, 1946.

The conditions of syringomyelia, syringopontia and syringobulbia are merely topographically different expressions of the same pathological process. They are said to be due to an anomalous congenital dysplasia of ectopic gliogenous cell rests within the neuraxis and the symptoms are caused by the sequelæ of development, maturative and degenerative processes which these undergo. The symptoms are produced in part by the direct involvement of the nuclear masses of fibre tracts whose normal location has been supplanted by hyperplastic cell rests. In part they arise from disturbance in vascular supply of normal nerve tissues due to degeneration, and diapedesis and hæmorrhage which may occur in abnormal vessels surrounding the hyperplastic zone. Also in great part the symptoms are produced by direct pressure on adjacent nerve tissue by collection of fluid under increased tension within the cavitations.

Two cases are reported in which surgical intervention was beneficial. The relief of the tension resulted in arrest in the progress of the disease, and even recovery of some of the neurological deficits. In neither case was an attempt made to obliterate the cavity.

PRESTON ROBB

Roentgenology

Ossification of the Coracoclavicular Ligament Following Dislocation of the Acromioclavicular Articulation. Soule, A. B. Jr.: *Am. J. Roentgenol.*, **56:** 607, 1946.

Post-traumatic ossification of the coracoclavicular ligament is a common sequela of avulsion of this ligament associated with dislocation of the acromioclavicular articulation. It is seem more commonly in dislocations which are classified clinically as complete. The ossification appears three to six weeks following injury and becomes complete in about eight to ten weeks following injury. If the ossification has not appeared within six weeks following injury, it probably will not appear at a later date.

The ossification does not appear to contribute to the disability of patients, but may aid in restoring continuity of the damaged ligaments and in stabilizing the acromioclavicular articulation. R. C. BURR

The Osseous Manifestations of Eosinophilic Granuloma. Hamilton, J. B., Barner, J. L., Kennedy, P. C. and McCort, J. J.: *Radiology*, **46:** 445, 1946.

Nine cases of eosinophilic granuloma of bone, confirmed by histopathological examination at the Army Medical Museum, have been reported with clinical and laboratory findings.

On the basis of the roentgen appearance, the diagnosis of eosinophilic granuloma may be strongly suggested, but histopathologic confirmation is necessary. A well circumscribed osteolytic lesion, with little evidence of reactive new bone formation, in a child or young adult, is suggestive of a granuloma. The condition, may, however, be closely simulated by a fibrosing osteitis developing after a closed injury to the skull. Meningiomas eroding the cranial vault and epidermoid cysts can usually be differentiated from eosinophilic granulomas on an analysis of the films. The meningiomas erode the inner tables more than the outer, and the epidermoid cysts originate in the diploe and expand through both the inner and outer tables of the cranial vault.

The necessity for confirmation of the diagnosis by biopsy has been stressed.

The use of roentgen therapy has been discussed. In our experience, irradiation relieved the pain associated with the lesions. R. C. BURR

OBITUARIES

Dr. Charles McQueen Avard, of Amherst, N.S., died at his home December 9, 1946, at the age of 81. He was born at Bristol, N.B., in 1865. Following graduation from the Normal School at Fredericton he taught school at Sackville and Middle Sackville. He graduated in 1895 from Jefferson Medical College. His first practice was at River Hebert where he was associated with the late Dr. W. R. Rockwell. He came to Amherst in 1900 and was a member of the first organized medical staff of Highland View Hospital. He took postgraduate work in Paris, Vienna, and London, returning to Amherst in 1914. In 1918 he moved to Scranton, Pa., where he practised until 1929. Since that time he has lived in Amherst. He was active in civic affairs and was for a period mayor of the town.

Dr. Benjamin Moore Bayly died in Moose Jaw, Sask., on November 30, in his 79th year.

Dr. Bayly was born in London, Ont., and graduated in medicine from Western University in 1889, later

taking postgraduate work at the University of Toronto. He was a member of the council of the Saskatchewan College of Physicians and Surgeons for many years and was widely known throughout western Canada.

A veteran of the First Great War, Dr. Bayly went overseas as medical officer of the 46th Battalion, C.E.F. Later he was with No. 2 Hospital Unit at Boulogne, France, and was with an advanced dressing station during the last year of the war.

He is survived by his widow and one son.

Le Dr Claude Beaulieu, âgé de 27 ans, et natif de l'Isle-Verte, est décédé jeudi le 5 décembre à l'hôpital militaire du Parc Savard.

Il fit ses études classiques au séminaire de Rimouski et ses études médicales à l'université Laval où il gradua en juillet 1944. Le Dr Beaulieu faisait partie de l'armée canadienne comme médecin.

Licencié en novembre 1944, il pratiqua sa profession à l'Hôtel-Dieu de Gaspé comme médecin résident jusqu'en 1946, alors qu'il cessa de pratiquer pour cause de santé.

Il laisse son épouse et un fils.

Dr. O. H. Bertrand died November 30 in Calgary.

Le Dr Aldéric Brosseau est décédé le 6 décembre à l'âge de soixante-douze ans. Né à Sainte-Thérèse-de-Blainville, il avait fait ses études au séminaire de l'endroit. Médecin anesthésiste, il exerça sa profession durant plus de quarante ans, à l'hôpital Notre-Dame.

Il laisse son épouse et deux fils.

Dr. J. R. N. Childs died in London, Ont., on November 25. Born in 1887, he graduated in medicine from the University of Western Ontario in 1909.

Dr. Wolfe Joseph Costello died December 1 at his home in Buckingham, Que. He was born March 18, 1878, at St. Chrysostome, Que.

After receiving his primary education he went to Montreal, where he graduated with his B.A. at St. Mary's College, in 1901. He also attended McGill University, where he attained his M.D. and C.M. in 1905, after which he returned to Buckingham to practise.

Besides following his career as a physician, Dr. Costello soon became interested in the public field. It is said that one of his greatest contributions to Buckingham and its institutions was in the cause of education.

He was a school commissioner for a period of 40 years and chairman of the school board for many years. In this capacity he was instrumental in improving educational facilities and equipment in his community.

He entered the political field in 1924, serving a two-year term as alderman. In 1930, he also was elected as mayor of Buckingham, and during his term achieved many benefits for the town. He also took an interest in provincial politics and was a past-president of the Liberal Association for Papineau County.

He was appointed coroner of Papineau County in 1933 and discharged the exacting duties up to the time of his death.

A devout churchman, he was past-president of the Holy Name Society. He was also a past grand knight of the Knights of Columbus.

He was an expert fisherman, but found little time for this outdoor hobby.

He is survived by his widow, five sons, and five daughters.

Le Dr Léo Duguay, ancien député du comté de Lac-St-Jean, à la Chambre des communes, est décédé le 4 décembre à l'âge de 46 ans. Il a fait ses études au Collège Ste-Marie et à l'université de Montréal. Il a pratiqué ensuite sa profession à St-Joseph d'Alma, au Lac St-Jean. En 1930, il était élu député du comté à la Chambre des communes, et en 1936, il représentait le comté à la Législature québécoise.

Il laisse dans le deuil sa femme, un fils et deux filles.

Dr. William J. H. Gould died on December 21 in Paris, Ont. He graduated in medecine from the University of Western Ontario in 1905. Surviving are his widow, two sons and one daughter.

Dr. A. E. Kennedy, of Stettler, Man., died in November, 1946, following a prolonged illness. He was a graduate of University of Manitoba in 1917. In 1920, he registered in Saskatchewan, and the same year registered with the General Medical Council of Great Britain. In 1922, he came to Alberta and commenced to practice at Camrose, later moving to Stettler. Dr. Kennedy, prior to the onset of his illness, was a member of the Council of the College of Physicians and Surgeons for District No. 3.

Dr. William C. McGuire, of Hamilton, died on December 7 in Toronto. Following his graduation from Western University in 1937, Dr. McGuire took postgraduate courses in England and Edinburgh, Scotland, and was made a Fellow of the Royal College of Surgeons, Edinburgh. Since securing these honours, Dr. McGuire returned to Hamilton, and was, until his illness, on the staff of the McGregor Clinic, where he specialized in surgery.

A member of the United Church and of the Rotary Club, Dr. McGuire had assisted in the work of the Rotarian orthopædic survey, from which many children benefited.

Dr. McGuire was born in Ripley, Ont., in 1910. While only a young man he had gained a wide reputation in his profession.

Besides his widow, he leaves one son, and one daughter.

Dr. Delaski Marr, for over 50 years a physician, died at his home in Ridgetown, Ont., on December 28, in his 76th year. He came to Ontario from his birthplace, Almont, Mich., when he was a year old. His father, the late Dr. Francis B. Marr, practised in Ridgetown for many years.

He graduated from the University of Toronto Medical School in 1893. Soon after, he went to New York and Edinburgh to take postgraduate studies. For some years he was associated with his father.

Dr. Marr was internationally known as a bowler and horticulturist. He was a director of the Ontario Society for Crippled Children. In 1932 and again in 1936 he represented Canada at international tournaments in Britain and on the continent.

A member of the Ridgetown High and Vocational School Board for many years, at the time of his death he was M.O.H. for Howard township and Ridgetown. He is survived by his widow, and two daughters.

Dr. Arthur Potvin died on December 12 in Quebec City, at the age of 83.

A graduate of Laval University he had been practising his profession for 55 years and was a former church warden at the Basilica.

In 1885 he joined the Voltigeurs and fought against Louis Riel and his rebels.

Surviving are his widow, and two daughters.

Dr. Henry Thomas Reason, aged 73, died in London, Ont., on December 31. He started his own business, the H. T. Reason Company, but ill-health caused his retirement 15 years ago.

In addition to business interests, Dr. Reason was actively associated with the University of Western Ontario, from which he had graduated in medicine in 1901. He served on the board of directors, and his

influence was effective in preventing the removal of the university to Toronto.

He was a former president of the Associated Board of Trade of Ontario, and president of the London Board of Trade. He was instrumental in getting action on rehabilitation of the harbour at Port Stanley. He was a former director of the London Baseball Club in the Michigan-Ontario League, and was one-time vice-president of the London Liberal Association.

Surviving are his widow, two sons, and two daughters.

Dr. Peter Luther Straith, aged 62, of Courtenay, B.C., died on December 1 at his home.

Born in Holstein, Ont., he attended schools in Woodstock and Mount Forest, and later taught school for several years on the Prairies. Later he returned to Ontario and graduated in medicine from the University of Manitoba. He practised for 15 years in Regina before moving to Vancouver Island.

Dr. Straith is survived by his widow, two daughters, a son, five brothers, and four sisters.

Dr. Gilbert Armitage Trenholme, aged 78, died on November 26 at Windsor, Ont., after a lengthy illness.

Dr. Trenholme was born in Trenholme, Que., and has lived in Windsor for the past 24 years, coming from Coaticook, Que.

He was a graduate of McGill University, and was a former governor of the Quebec College of Physicians and Surgeons.

He was a member of Rose Lodge 500, A. F. and A. M.

He is survived by his widow, one son, and two daughters.

Dr. Gerald S. Williams, veteran of the two world wars, and for many years superintendent of the Children's Hospital, Winnipeg, died at Deer Lodge Hospital on December 2, aged 57. Born in Winnipeg he was educated in the local schools and graduated from Manitoba Medical College in 1913. During the first world war he served overseas with the R.A.M.C., transferring later to the R.C.A.M.C. At the end of the war he returned to Winnipeg, served with the soldiers' civil re-establishment board and was also in general practice. In 1923 he became superintendent of the Children's Hospital, and developed a talent for administration. He was a director of the Manitoba Hospital Association and a Fellow of the American College of Hospital Administrators. On the outbreak of the second world war he obtained leave of absence from the hospital from 1940 to 1944. He was medical officer of the 10th Signal Corps, served overseas and obtained the rank of lieutenant-colonel.

Dr. Williams was keenly interested in golf and curling. He was a member of the vestry of St. Paul's Anglican Church, Fort Garry. He is survived by his widow, a daughter and two sons.

C. F. Wylde, F. J. Tees, C. R. Bourne, N. T. Williamson

An Appreciation "Conjoined in One"

C. L. ROMAN
Valleyfield, Que.

In the space of four weeks, death took from the staff of the Montreal General Hospital four members whose professional attainments were respected and whose passing was mourned. C. F. Wylde was on the threshold of four score years and was known for his serene, tolerant and unchanging disposition. F. J. Tees was in his mid-sixties and personified a smiling, cheerful geniality that warmed the hearts of a wide circle of friends. C. R. Bourne, of the same age, was a clinician of broad experience whose life was marked with sincerity of purpose and an unassuming devotion to his profession. N. T. Williamson, the youngest of the four—he was only fifty-three—was esteemed for his kindly personality, his vigorous forthrightness and his outstanding ability in his chosen field.

In common, they contributed much to the stability of the medical staff of their hospital and, in their way of life, were examples in the fine traditions of a great hospital. It is of medical interest that the three eldest of this group made their exit through the door of vascular frailty, while the youngest slowly passed through the dark and grim vestibule of hopeless and relentless neoplastic tragedy. The four will be missed and the memory of their comings and goings, with the redolence of high conscience and dedication, will always be an inspiration to the circle which they honoured. "They enlightened the darkness that surrounds our path", and, to paraphrase Havelock Ellis, their final accomplishment lay in giving into the hands of the runners whom they outpaced in the torch-race of life the living torch, bright and unflickering, as they themselves disappeared in the darkness.

NEWS ITEMS

Alberta

The Board of Directors, Alberta Division, Canadian Medical Association, met in Edmonton on December 2, 1946. The dates set for the 1947 Convention were approved. It is to be held in Edmonton at the MacDonald Hotel on September 10, 11, and 12, 1947. Dr. Harold Orr was appointed to deputize as chairman on the Committee on programme and arrangements.

The Board of Directors approved of the appointment of life membership of medical men who have been registered in the Province of Alberta for a period of 40 years, and in good standing for that time. The following doctors were granted life membership: Aiken, G. M.; Anderson, W. G.; Archer, A. E.; Ardiel, A. E.; Birch, J. H.; Chrystal, R. J.; Creighton, J. A.; Dixon, Ivan; Farquharson, W. O.; Gibson, H. A.; Graham, M.; Lamb, W. V.; Learmonth, G. E.; Lincoln, W. A.; McKidd, L. S.; MacDonald, T. G.; Mason, E. G.; May, L. W.; Macdonnell, J. J.; McGuffin, C. F.; McLaren, D. D.; Oatway, R. M.; O'Hagen, Thomas; Quesnel, Phillip; Redmond, W. C.; Scott, W. H.; Proctor, Richard; Shirreffs, H. S.; Stanley, G. D.; Staples, C. A.; Stevenson, T. B.; Sullivan, F. A.; Wilson, W. A.

Senior Members, Canadian Medical Association.—Braithwaite, E. A.; Campbell, P. M.; Lafferty, A. M.; McEachern, J. S.; Pope, E. L.

The following were elected to the Council of the College of Physicians and Surgeons of Alberta: Dr. J. W. Richardson, Calgary; Dr. S. M. Rose, Lethbridge; Dr. J. D. Neville, Camrose. Dr. Richardson replaces Dr. W. A. Lincoln, who has retired from practice, and Dr. Neville replaces Dr. L. M. Rogers, who has moved from the district.

G. E. LEARMONTH

British Columbia

First registration of blood donors for the Red Cross Blood Transfusion Service will commence in British Columbia in January. British Columbia is the first Province to organize the new Service under a national Red Cross program. The new Service aims at providing free blood and plasma for all hospital patients needing such service.

Dr. Stuart Stanbury, the National Director of the program will visit Vancouver to inaugurate the Service.

Headquarters in B.C. will be at the Red Cross Depot and laboratory at Shaughnessy Hospital. The newly appointed Provincial Director is Dr. W. G. Rice. Dr. Rice was formerly with the Banting Institute in Toronto. He saw extensive service with the Navy during the war.

The Annual Meeting of the Medical Services Association was held on Monday, December 30, 1946. The Directors report that membership has increased 63% during the past year. The Association now covers some 295 groups employing approximately 80,000 individuals.

St. George's Hospital at Alert Bay, which has been operated for many years by the Columbia Coast Mission, has recently been taken over by the St. George's Hospital Society representing the larger logging interests in the Alert Bay area. The aim of the new Society will be to modernize and improve the hospital facilities in the area.

The Board of Directors of the Royal Jubilee Hospital, Victoria, B.C. have announced that Dr. T. W. Walker, who has been superintendent for the past thirteen years, is retiring.

Dr. Walker will be succeeded by Dr. Morley Beckett who has been assistant director of the University Hospital, Ann Arbor, Michigan.

Dr. M. R. Caverhill, till now Executive Secretary of the College of Physicians and Surgeons of B.C., and British Columbia Medical Association, has resigned this post and is a senior medical officer with the Workmen's Compensation Board.

Whilst his resignation is felt as a severe loss to the Council of the College and B.C. Medical Association, we feel that the Workmen's Compensation Board is to be congratulated on the acquisition of this very capable executive officer.

The British Columbia Branch of the Canadian Cancer Society together with the B.C. Cancer Foundation are initiating plans for another joint cancer campaign in April, 1947. This will be part of the international campaign against cancer.

Initial meetings of the joint campaign committee have been held, and it is hoped to complete the campaign organization throughout the Province at an early date.

J. H. MACDERMOT

Manitoba

The Manitoba Medical Association has named its president, Dr. J. R. Martin, Neepawa, as its representative on the Manitoba Sanatorium Board to succeed Dr. S. Schultz.

Dr. Bruce Chown, Winnipeg, has returned from attending a meeting of research workers in the Rh factor at Baylor University, Texas, and the International Blood Transfusion Congress at Mexico City.

Offices in the new addition to the Medical Arts Building, Winnipeg, are now being occupied.

Dr. Digby Wheeler, Winnipeg, has returned from a meeting of the Inter-American Congress of Radiology at Havana, Cuba, where he read a paper on "Diverticula of the foregut".

The report of the Rockefeller Foundation on personnel training requirements of the Health Services Act of Manitoba has been presented. One recommendation, that the number of medical students be increased by 20 to 25%, has been met by the action of the Board of Governors of the University raising the number of students admitted to the first year from 60 to 70. Other recommendations were that the curriculum of the Faculty of Medicine should be reviewed in terms of training the basic doctor to meet the job analysis requirements of the municipal doctor, and that the first step toward this reorientation should be the appointing of a full-time head of a department of social and preventive medicine. He would be assistant dean and would act in liaison capacity with the department of health and public welfare. The report also recommended that full-time heads be appointed for the departments of medicine, surgery, obstetrics and gynæcology, and of roentgenology. Another suggestion that the governments and universities of the four western Provinces should set up a Joint Planning Commission so that a common medical program could be realized.

The Rockefeller commission finds that the smaller communities of Manitoba are lacking in "doctor's workshops", *i.e.*, medical nursing units of 6 to 12 beds, in opportunities for postgraduate training, and in many instances, are also lacking in proper housing, schools, recreational and religious facilities and adequate communications.

Dr. John B. Grant, chairman of the Special Commission of the Rockefeller Foundation, gives it as his opinion that "The Manitoba health plan is the most realistic approach in Canada that we have knowledge of for the provision of better health services".

A new and modern health and occupational centre for veterans convalescing from war wounds is to be erected at Kirkfield Park, about three miles west of Deer Lodge Hospital. Work on the new institution is already in progress and it should be ready for occupancy some time in 1947. When completed it will provide accommodation for some 200 patients. They will be housed in a series of eight bungalows grouped around the administration building.

Some of the special features will include physical medicine building complete with gymnasium, swimming pool, bowling alley and physio- and occupational therapy departments.

Drs. Walter Alexander and Robert S. Ramsay have been appointed assistant ophthalmologists to the Winnipeg General Hospital.

More than 82,000 persons have been x-rayed for tuberculosis in 24 municipalities in Manitoba and the cities of Portage la Prairie and St. Boniface. In addition more than 20,000 were given x-rays by the survey unit of the Winnipeg health department. In January all university students will be x-rayed and later, with the co-operation of the Winnipeg health department, a survey of 12,000 Winnipeg school children will be undertaken. The Sanatorium Board will purchase a second mobile x-ray unit.

During the past 15 years the tuberculosis death rate in Manitoba has decreased 31%, and when Indian deaths are excluded, the reduction is 54%.

Deer Lodge for veterans has added a plastic surgery department and an allergy clinic. The facilities of the occupational and pathological departments have been greatly increased.

Dr. W. Stuart Stanbury, national director of the blood transfusion service of the Canadian Red Cross announced that proposals for opening a blood transfusion depot and service are being discussed with the Manitoba government.

Winnipeg's births set an all time record in 1946. Live births registered in the city for the past year numbered 7,010, with boys in the majority by 190. The 1945 total of births was 5,641.

The regular monthly meeting of the Winnipeg Medical Society on December 13 was highlighted by the presence of Dr. Rudolph A. Peters, Professor of Biochemistry, Oxford University. His address dealt with the progressive steps which led to the discovery of British anti-lewisite, which has proved so successful not only against the arsenical gas but against all other forms of arsenical poisoning. It was the story of brilliantly planned deductions told in a modest but impressive way. The speaker was introduced by Prof.

A. T. Cameron and a vote of thanks at the conclusion of the address was moved by Dr. F. D. White, both of whom had known Dr. Peters. Dr. B. E. Loadman spoke on "The Bridging of Bone Defects" as practised in Deer Lodge Hospital and showed numerous x-ray plates. He emphasized the value of cancellous bone.

At a public meeting in the recently completed Memorial Wing of Bethel Hospital, Winkler, on December 22, the assistant secretary of Manitoba Pool Elevators presented a cheque for $2,000 to the Bethel Hospital Society. Mr. Richmond stated that the sacrifices made by the young men of rural Manitoba during the war prompted the group to set aside a memorial fund in order to make rural life more attractive. A few months ago Crystal City Hospital received a similar gift. Peter Brown of the Hospital Board in accepting the gift said that the hospital which had been started in 1936 with 15 beds now has 38 beds. Included in the new wing are x-ray and laboratory fittings, two operating rooms and adequate office and staff facilities. Dr. F. W. Jackson, deputy minister of health, said that Winkler hospital zone had been the first to reach the objective of five beds per thousand of population aimed at by the department of health.

ROSS MITCHELL

New Brunswick

Dr. H. H. Hatfield of the New Brunswick Department of Health is now directing the work of the V.D. Division of the Department.

Dr. J. E. M. Carnwath who has practised for long years at Riverside, Albert County, is disposing of his practice preliminary to retirement. For many years Dr. Carnwath supported a cottage hospital which was of great service to his community.

Dr. J. A. Melanson, chief medical officer of New Brunswick received a special certificate of merit from the Commander of the Hospital of St. John of Jerusalem, for his outstanding services to the order in peace and especially during the past war.

The Saint John Medical Society, entertained at a banquet for the veterans of World War II recently at the Bungalow, Pleasant Point. Out of town visitors included Dr. D. F. W. Porter of Sussex Military Hospital, and Dr. L. DeV. Chipman of Wolfville, N.S.

Dr. E. H. Petrie of Saint John, and Dr. J. S. Hynes of Fredericton are attending the mid-winter meeting of the Canadian Association of Radiologists at Quebec City.

A. S. KIRKLAND

Nova Scotia

A Cape Breton artist has been making sketches of Cape Breton celebrities. There recently appeared in the *Sydney Post Record* a well executed picture of Dr. H. A. Ratchford of Inverness. It is noted in a small inserted sketch over the doctor's left breast that horses are his hobby.

Dr. D. B. MacPherson of North Sydney, well known for his treatment of cancer, died at his home in December.

Dr. W. S. Gilchrist, of Pictou and Halifax, is sailing early in January for Angola, West Africa, where he will resume his medical missionary work, interrupted by his years of service in the Canadian Army Medical Corps. Dr. Gilchrist is taking with him a jeep and large quantities of medical supplies.

During the war the Federal Government paid the City of Halifax the sum of $30,000 yearly to assist in the maintenance of its health service. This grant has ceased as of December 31, 1946.

Dr. C. M. Bethune, Superintendant of the Victoria General Hospital, spent part of the Christmas holidays visiting with his mother and sister in Boston.

Dr. Lynn Bashow, after a period of postgraduate work in Calgary, has established himself in practice at Goldboro. This community has been without a physician for several years and the people greeted their new doctor with open arms. They had a house for him, a liberal supply of coal in the cellar, and even a substantial stock of groceries to hearten his arrival.

Dr. H. E. Levittan has left Guysboro. After a period of rest, he will follow postgraduate work in internal medicine. Dr. Frank Hazen will take over his practice.

Dr. Harold Roby of Truro, has opened a practice at Oxford.

H. L. SCAMMELL

Ontario

The Fourth Alumni Lectureship at the University of Western Ontario Medical School took the form of a three-day symposium on diabetes. The principal speaker was Dr. E. P. Joslin, of Boston. He spoke on "The Treatment of Diabetes, Diabetic Coma and the Insulins", as well as taking part in the clinical conferences. Dr. C. H. Best, of Toronto, spoke on "Endocrine Control of Carbohydrate Metabolism". Professor Moses Barron, of Minnesota, spoke on "The Basis of Banting's Discovery"; he stated that it was one of his articles published in 1920 which stimulated Banting's research.

Members of the staff of the Faculty of Medicine also gave addresses. Clinical conferences were held by the medical staff of Victoria Hospital led by Professor F. S. Brien; at St. Joseph's Hospital led by Dr. H. O. Foucar and Dr. S. M. Fisher and at Children's Hospital led by Professor H. S. Little.

The symposium was well attended. In addition to the medical students, nurses and dietitians there was a large attendance of practicing physicians from both London and southwestern Ontario, including over 100 doctors representing fifteen counties. Dr. Joslin attended the annual student banquet where he gave a charming address full of personal reminiscences from his long interesting career.

Dr. Harry M. Nelson, President of the Detroit Institute for Cancer Research, addressed the Women's Council of the Ontario branch of the Canadian Cancer Society at a luncheon in the King Edward Hotel, Toronto, in December. Many women delegates paid their own expenses from various parts of Ontario. The nine Provincial secretaries, who were in Toronto for a meeting, attended.

Dr. Nelson said that the American Cancer Society raised $1,500,000 last spring. This money is divided between the state organization and the national organization. The State gets 60% of monies collected. This is used for education and service but it may be used for State research. The central organization asks for the submission of a budget from each State. Forty per cent of the monies collected goes to the national organization and 25% of this is spent on basic scientific research. More recently they have concentrated on the problem of cellular growth.

The big problem of the American Cancer Society is how best to spread information. In 1935 the National Women's Field Army was formed, and it has proved to be one of the greatest factors in the dissemination of information. The interest of the women is vital. There is a branch in every State but one. The policy of these State branches is supervised by the national executive in New York. They found that the program in the hands of lay women, rather than in the hands of men, made for sympathy and patience and much volunteer work.

The cancer work should not conflict with any other health activity. He advised against the Cancer Society taking part in a community fund drive because, if they did, the educational value of the drive was lost. The National Research Council is its adviser in research. He stated that the greatest problem was education among the doctors. To help in their education, the Cancer Society is paying the expenses of the County Medical Society Secretaries to go with the cancer people on their trips and meetings and speak to the public directly. A journal is to be published and sent to every doctor in the United States without charge. The articles in this journal are to be written for the general practitioner and not for the specialist.

A survey of existing activities in cancer research is being made by the national office. Support is being given to young scientists with fellowships so that they can go on in this research work. There are now about twenty fellowships available, worth about $3,000 a year apiece.

This Society has two objectives,—the long range object to find the cause of cancer, and the short range object to cure it. That is, to use the resources available to save more lives. The factors necessary are early recognition by the patient, early recognition by the doctor, prompt and adequate treatment. There is a demand for more diagnostic and treatment centres. At present the four divisions of cancer work are: (1) The information centre. (2) The detection centre, which gives physical examination for well people. This is considered to be part of the educational program. (3) The diagnostic centre, where patients are sent when cancer signs are present. These centres have special equipment and are ready to take biopsies, to make extensive x-ray studies, and to do complete blood work, to give the patient a correct diagnosis. (4) There is the treatment clinic. Nearly every large city has a treatment clinic attached to one of its general hospitals.

Physicians should report every case diagnosed and treated. Some States call for reporting of cancer cases. Connecticut has had volunteer reports for eleven years, and they have the best statistics in the Union. This was achieved by paying hospitals for sending in complete reports and some hospitals add greatly to their income by co-operating with the Health Department of the State. Cancer has declined in certain age groups, *i.e.*, up to 55 years of age. The increase is in the groups over 55. The population is growing older. One-third of the population reaches 45 years as against one-fifth a few years ago.

The research scientists have now began to push back the iron curtain!

The University of Toronto recently announced a bequest of approximately $500,000 by the late Dr. John S. Chisholm of Prince Albert, Sask., for the use of the University's Faculty of Medicine. Dr. Chisholm died on September 6, 1945.

In his will, Dr. Chisholm left another $500,000 to his sister, Mrs. W. G. Collison of Lindsay, Ont., wife of Dr. W. G. Collison. Interest on this amount will be used by Mrs. Collison during her lifetime and, by the terms of the will, this sum also will revert to the University of Toronto on her death. University officials said the bequest "will enable us to do a lot of work not provided for in the regular funds", particularly in medical research in which Dr. Chisholm was interested.

LILLIAN A. CHASE

D. H. C. Riley of Regina was in Toronto December 2, attending a Red Cross conference on the proposal to provide blood for transfusions to the hospitals of Canada.

Dr. and Mrs. A. L. Danard of Owen Sound celebrated their golden wedding in Christmas week and received congratulations from many of Dr. Danard's colleagues throughout the Province.

Dr. George S. Young has given up his rooms in the Toronto Medical Arts Building. For many years he enjoyed a large practice as consulting physician besides giving largely of his time and energy to the work of the Canadian Medical Association and its Ontario branch. In his retirement he will still maintain his interest in the Academy and the Canada Cancer Society and will also be available for bedside consultations.

Dr. Peter Cameron who has been working in Christie Street Hospital, Toronto since his demobilization has been transferred to Belcher Hospital in Calgary.

Dr. James W. Ross who served as chief in surgery at Camp Borden and Toronto Military Hospital during the war has returned to his post as chief of surgical service No. 2 in St. Michael's Hospital, Toronto.

The Medical History Club of Toronto heard a paper by Dr. F. C. Trebilcock at its December meeting. The subject was "The first hundred years of Moorfields". The science of ophthalmology owes so much to this famous centre that an account of its origin and growth and sketches of the men who laid the foundations of its development made the essay important aside from the interest it awaked.

A conference of Provincial secretaries of the Canada Cancer Society was held in Toronto early in December. A week was spent in discussing problems of organization for a nation-wide campaign for membership in the society which is to be made in April. Dr. George S. Young, past president, and Mrs. Young entertained the secretaries at dinner and Mr. F. C. Stephenson, of London, the new president, presided.

The Academy of Medicine, Toronto, had three distinguished guest speakers in December. Dr. Reginald Smithwick, Professor and Chairman of the Department of Surgery, Boston University School of Medicine, lectured on "Surgery of the autonomic system; Dr. Hans R. Sauer of Roswell Park Memorial Institute, Buffalo, on "Diagnosis and treatment of tumours of the bladder" and Dr. George Smelzer, Institute of Ophthalmology, New York, read a paper on "Experimental exophthalmos".

The Workmen's Compensation Board of Ontario has been for some years endeavouring to raise the standards of treatment of fractures and improve results in other types of traumatic surgery. Some years ago Dr. John Laing McDonald was made consultant to the Board and various measures were adopted to supervise treatment of serious injuries to workmen and, especially, to check the management of fractures. As a further development of this policy the Board arranged for a four day school of instruction, January 21 to 24 inclusive, in Toronto. They were fortunate in securing the services of Sir Reginald Watson-Jones, B.Sc., M.Ch.(orth.), F.R.C.S., who is in Canada to conduct the course.

The Board is to be highly congratulated on its enterprise in bringing so eminent a surgeon and teacher to give the instruction. The industrial surgeons throughout the Province who will benefit by it are also to be congratulated on the unique opportunity afforded them.

M. H. V. CAMERON

Quebec

When a hospital with a history like that of the Montreal General Hospital celebrates the 83rd birthday of one of its most notable nurses, it brings out striking links with the past. This was the case on Saturday afternoon, December 14, 1946, when Miss Jennie Webster, a former night superintendent of the Hospital, held a birthday At Home in the Nurses Residence for those who had been housemen during her long period of service: she had always referred to them and still does, as "her doctors", and those qualifying to belong to the group well remember the solicitude as well as the

admonitions with which she followed them. She is now confined to her wheel chair with arthritis, but is as cheerful and as bright as ever. Her celebration brought together a large group of men numbering over one hundred, led in years by Dr. A. T. Bazin whose signature for 1894 in the visitors' book easily surpassed the record of anyone else, although there were still a few who could not be present who could have equalled that.

Tribute to Dr. Wesley Bourne

A group of Anæsthetists in Montreal have brought to our attention the following letter which was sent to Dr. Wesley Bourne by Dr. Georges Cousineau, Secretary of the Quebec Section of the Canadian Society of Anæsthesia. The incident is judged worthy of report as illustrating the harmony of relationship between the French and English-speaking groups in Quebec. Incidentally also it is a very pleasant and fully deserved tribute to Dr. Bourne.

"A notre dernière réunion de la section Québecquoise de la Société Canadienne d'Anæsthésie, il est proposé et adopté à l'unanimité qu'un vote de remerciement soit adressé au Docteur Wesley Bourne qu'a bien voulu aller nous représenter à Londres, à l'occasion de la célébration du Centenaire de la découverte de l'éther. A cette occasion, spontanément tous les membres présent détient les cordons de leur bourse et vous offre, mon cher Docteur, l'expression tangible de leur reconnaissance et me charge de vous remettre le chèque ci-inclus.

Veuillez, cher confrère aîné, accepter ce modeste cadeau de vos amis sincères, les Anæsthésistes de Québec. Nous sommes fiers, nous sommes reconnaissants et nous voulons suivre toujours (c'est à vous maintenant que nous appliquons cette expression que vous appliquiez autrefois au Docteur Laroque) notre 'panache blanc'."

On commencera bientôt, à Drummondville, la construction d'un nouvel hôpital qui coûtera près d'un million de dollars. Un hôpital est également projeté pour la région de St-Joseph d'Alma.

Le Dr Georges Deshaies de l'hôpital du Sacré-Cœur a été nommé professeur agrégé de chirurgie thoracique. Le Dr Jacques Bruneau de l'Hôtel-Dieu, a été nommé assistant-universitaire à la clinique chirurgicale de cet hôpital. L'hôpital Ste-Justine annonce la nomination de 5 nouveaux consultants: le Dr Georges Cloutier, en chirurgie plastique; le Dr Jean Denis, en allergie; le Dr Réal Doré, en chirurgie du goître; le Dr Mercier Fauteux, en chirurgie cardio-vasculaire et le dentiste Lucien Reeves en chirurgie maxillaire. Toutes ces nominations sont de l'Université de Montréal.

Le Dr Valmore Latraverse était le secrétaire français du premier congrès pan-américain d'O.R.L. tenu à Chicago en octobre dernier.

La Faculté de médecine de l'Université de Montréal vient de faire paraître le premier numéro de son Bulletin,—16 pages,—qui paraîtra trois fois l'an.

Le Dr Paul Bourgeois de l'hôpital Notre-Dame vient d'être élu membre correspondant étranger de la Société française d'Urologie. JEAN SAUCIER

General

Award to Dr. Routley.—We feel that our readers will be interested in the following letter recently received by our General Secretary.

"We have great pleasure in informing you that our Board of Directors at their sitting of September 21, in recognition and appreciation of your personal and continuous efforts has awarded you the Greek Red Cross's Silver Medal, the highest reward of the Society and has instructed us to convey to you their sincere congratulations for this distinction so highly deserved.

(signed) A. PHILON, *President*
(signed) C. AGAPITOS, *Secretary General*
Croix Rouge Hellenique"

Athens, October 22, 1946.

The World Medical Association.—The second meeting of the Organization Committee of the World Medical Association was held in Paris, France, on November 15 and 16, 1946, with the following members present: T. C. Routley, Canada, (Chairman); Paul Cibrie, Paris, and Chas. Hill, London, (Joint Secretaries); D. Knutson, Sweden; P. Glorieux, Belgium; O. Leuch, Switzerland, (Hon. Treasurer); J. A. Pridham, Great Britain; A. Zahor, Czechoslovakia; F. Decourt, France.

Regrets were received from L. G. Tornel of Spain and I. Shawki Bey of Egypt.

Considerable time was occupied with the examination of the proposed Constitution and By-Laws which, upon request, had been prepared by Dr. Cibrie and Dr. Hill. The amended document will be circulated to the constituent national medical associations and will be reviewed again by the Committee at its next meeting which it was proposed should be held in London on April 15 and 16, 1947. It was agreed to communicate with all national medical Associations who were invited to the London Conference in September, 1946, setting forth the aims and objects of the Association and urging that membership be completed.

The Committee was pleased to be informed that, since its first meeting in September, the national medical associations of the following countries had joined the Association: the United Kingdom; Belgium; the United States of America; Canada. The Committee unanimously agreed to invite the American Medical Association to appoint a member to the Committee.

NOTE—Subsequently, the American Medical Association appointed to the Committee one of its Trustees in the person of Dr. Louis Bauer of New York who is also President-Elect of the New York State Medical Association.

On invitation, Dr. Cibrie was appointed an observer to the first General Assembly of the United National Educational Scientific and Cultural Organization, meeting in Paris in November and December, 1946.

The Chairman reported upon the meeting of the Interim Commission of the World Health Organization which he had attended in Geneva, November 4 to 13, 1946.

The Committee hopes to complete the drafting of the Constitution and By-Laws and other necessary arrangements for the World Medical Association to hold its inaugural meeting in Paris in the autumn of 1947.

S.S. Frederick Banting.—The following note has been sent us by Dr. J. R. Williams, Rochester, N.Y.

The *Frederick Banting* was delivered to the British Government, under Lend-Lease, on December 30, 1943. She has since been operated by them to ports in Japan, China, Australia, India, and the Mediterranean, one of her recent trips being from Liverpool to Halifax.

The following were received into Fellowship in the **American College of Surgeons** at the Convocation on December 20, 1946: Ontario.—Harry D. Alexander, Brantford; Walter F. Charteris, Chatham; Robert B. Hare, Simcoe; William T. Haslett, London; Ernest Clifford Janes, Hamilton; Hewson I. J. Kellam, Ottawa; Russell K. Magee, Peterborough; Angus D. McLachlin, London; Harold F. Mowat, Copper Cliff; J. Reginald Rogers, London; Alexander G. Smith, North Bay; W. P. Tew, London. Quebec.—Lionel Groleau, Sherbrooke; John S. Henry, Montreal; Gerard A. P. Hurley, Montreal; Everett F. Hurteau, Montreal; Clarke K. McLeod, Montreal; François Roy, Quebec City; Jacob C. Schwartzman, Montreal.

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MONTREAL CANADA

British Commonwealth and Empire Health and Tuberculosis Conference, 1947.—A Conference on Tuberculosis, arranged by the National Association for the Prevention of Tuberculosis of Great Britain, will be held in London on July 8, 9, and 10, 1947. The Conference will deal with tuberculosis in all its aspects, but with special reference to the problem as affecting the British Commonwealth, and representatives from all the Dominions and Colonies have been invited.

The sessions will include discussions on Tuberculosis in the British Commonwealth and the Colonial Tuberculosis Services; Sanatorium design; after-care and rehabilitation; the psychology of tuberculosis; new discoveries in the prevention and treatment of the disease, and the National Health Service and its effect on tuberculosis schemes.

Plans are being made for overseas guests to see something of the anti-tuberculosis work for which Great Britain is famous, and will include visits to Sanatoria, hospitals and clinics, and demonstrations of various kinds. The Conference is open to both doctors and laymen, and fuller particulars can be obtained from the Secretary-General, National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London, W.C. 1.

Civil Aviation Medicine.—To advise the Department of Transport concerning all health aspects of civilian flying, the Department of National Health and Welfare has established a new division of civil aviation medicine. A competition for the post of chief of the division has just been announced by the federal Civil Service Commission.

The new division will be responsible for directing the development and maintenance of medical standards for persons engaged in civil aviation. It will draw up regulations to protect the safety, comfort and health of flying personnel from a medical standpoint and will advise on the general aspects of all problems connected with the health of travellers by air. These include oxygen supplies, air sickness, and colour blindness. The division will work closely with the Department of Transport, the R.C.A.F. and private organizations doing research in this branch of medicine. Chief of the division must be a medical doctor, preferably with postgraduate training, with at least four years' experience in aviation medicine and substantial flying experience.

The annual meeting of the Northwest Conference in Dental Medicine is to be held at Harrison Hot Springs Hotel, Harrison Hot Springs, B.C., May 18 to 21 inclusive, 1947. For further particulars contact the Secretary: C. R. Hallman, D.M.D., 4298 Dunbar Street, Vancouver, B.C., Canada.

American Board of Ophthalmology.—A directory of all diplomates to January 1, 1947, will be published shortly after that date. This directory will be arranged alphabetically and geographically. No biographical material will be included. Every effort will be made to make this directory accurate and diplomates who have not already done so should notify the Board office at once stating their name and address exactly as they wish them listed. Price is $3.00 postpaid.

NOTE: Diplomates are requested to keep the Board office informed of all changes of address so that the files may be kept up-to-date.

1947 Examinations.—Atlantic City, June 8 to 13; Philadelphia, June 13 to 16; Chicago, week of October 8. Executive office: American Board of Ophthalmology, Cape Cottage, Maine.

A whistle that emits sound waves of too high a frequency to be detected by human ears, but which does irritate pigeons, is to be used experimentally to drive out perching pigeons on a public building in the west.

BOOK REVIEWS

Allergy in Practice. S. M. Feinberg, Associate Professor of Medicine and Chief of the Division of Allergy, Northwestern University Medical School, with the collaboration of O. C. Durham, Chief Botanist, Abbott Laboratories, C. A. Dragstedt, Professor and Chairman of the Department of Pharmacology, Northwestern University Medical School. 838 pp., illust., 2nd ed. $10.50. The Year Book Publishers, Inc., Chicago, 1946.

The author and collaborators have succeeded admirably in covering not only the so-called "conventional phases" of allergy; but they have brought the text up-to-date in this rapidly extending field. A discussion on histamine in anaphylaxis and allergy, by Dr. Carl Dragstedt is included, and one on histamine antigens. A comprehensive bibliography is available at each chapter's end; in spite of the necessity for condensation in the text (in attempting to cover the field in one volume), material is presented in an interesting and lucid manner. It is one of the most generally useful volumes available on the subject.

Bacteria in Relation to Nursing. C. E. Dukes, Lecturer in Bacteriology to Sister Tutors at King's College for Household and Social Science. 186 pp., illust. 12s. 6d. H. K. Lewis & Company Limited, London, 1946.

This book is written primarily for nurses. It starts at the beginning and carries the student through the methods of studying bacteria, their classification and identification. Helpful chapters are included on immunity, on sterilization, cross infection and the use of disinfectants and antiseptics. A major section deals with the collection and examination of specimens. Very little is included on virus diseases. The work is a practical one, has good though limited illustrations and can be recommended for use in schools of nursing or for the training of technicians.

Gynæcology for Nurses. A. D. Campbell, Gynæcologist and Obstetrician-in-Chief, Montreal General Hospital, Montreal; and M. A. Shannon, R.N., Supervisor of the Gynæcological Ward, Montreal General Hospital. 274 pp., illust. F. A. Davis Company, Philadelphia, 1946.

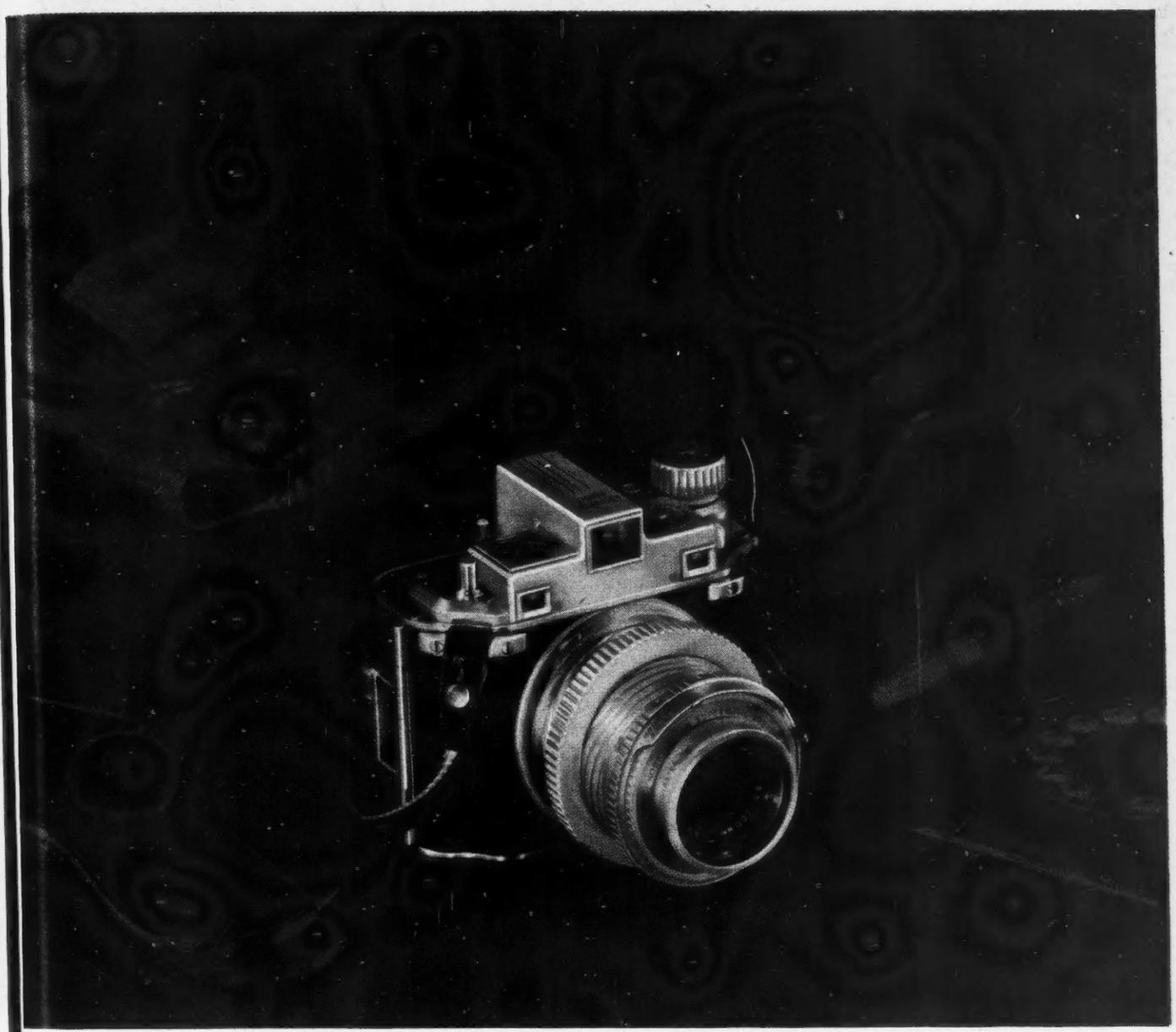
Probably in no other field of medicine has there been more change than in gynæcology, so that the old has more rapidly become obsolete. Dr. Campbell has succeeded in presenting the new knowledge in clear and authoritative fashion. Unit One which deals with anatomy, physiology and endocrinology is especially good. The other units deal with normal and abnormal pregnancy, diseases and disorders, office gynæcology and the hospital patient and procedures. The authors have had assistance from several of their colleagues of deservedly high reputation. Coloured plates depicting an unruptured ectopic pregnancy and cancer of the cervix are worthy of praise.

Since this book has grown out of the notes of lectures to nurses there is the occasional clumsy sentence. However, these are minor defects which detract only slightly from the value of the work.

Though the book was written for nurses and will prove very useful to them, yet medical students, interns and even doctors long in practice could learn much from this able presentation of modern gynæcology.

Introduction to Clinical Neurology. G. Holmes, M.D., F.R.S. 183 pp., illust. 12s. 6d. E. & S. Livingstone Ltd., Edinburgh, 1946.

The clinical teaching of Dr. Holmes at the National Hospital, Queen Square has attracted postgraduate students to London for years and many Canadians are deeply in his debt. In this book he now presents to a wider circle, the experience and methods in clinical



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neurological examination which made his clinical rounds and discussions so illuminating and instructive.

This book is not a description of nervous diseases. It is a discussion of the production of neurological signs and symptoms. In this, the methods of neurological examination and history-taking are outlined. The anatomical and physiological knowledge essential to the understanding of paralyses, ataxia, convulsions, sensory deficits and reflex changes are incorporated in chapters which discuss these disorders. Similarly the pathogenesis of visual disturbances, ocular palsies, postural and vestibular disorders and speech are discussed. An excellent chapter on agnosia and apraxia, a review of symptoms in bladder and rectum, autonomic system and mental state conclude this thin volume. The whole book is outstanding in the simple clarity with which these complex disorders of structure and functions are resolved into their anatomical and physiological components. There is a lucidity here that is not common in neurological writings and which springs from Dr. Holmes' scholarship and experience in clinical teaching. For all medical students and graduates this book will be a major addition to their libraries.

Medicine as a Profession. G. H. Murphy, Professor of Clinical Surgery, Dalhousie University, Halifax. 74 pp. $1.50. The Ryerson Press, Toronto, 1946.

This is a pleasantly discursive little book in the form of letters to medical students, a kind of "Virginibus puerisque". Indeed, the opening sentences paraphrase the first paragraph of Stevenson's famous essay. The book is full of the philosophy of a man who can look back on a full and well spent career. It is aimed at the student, but will give older men also something to think about.

Penicillin, Its Properties, Uses and Preparations. Published by direction of the Council of the Pharmaceutical Society of Great Britain. 115 pp., illust. 10s. 6d. The Pharmaceutical Press, London, 1946.

This volume was prepared for the guidance of pharmacists and general practitioners in the preparation and use of penicillin. It includes an interesting historical summary and gives a fairly full account of the methods of manufacture, standardization and preparation of the various penicillin compounds. The pharmacology and chemistry of the drug is also discussed: there is, however, no reference to the recently accomplished synthesis of penicillin. This is unlikely to be of practical importance for some time to come.

Only 24 of the book's pages are devoted to the clinical use of the penicillin group; this diminishes its value to the clinical physician. These few pages give an up to date summary of the drug's uses. A fairly extensive bibliography is appended. There is also a short chapter on legal considerations governing the preparation and dispensing of penicillin in Great Britain and America.

Penicillin. Under the General Editorship of Professor Sir Alexander Fleming, Professor of Bacteriology in the University of London, St. Mary's Hospital, London. 380 pp., illust. $7.50. Butterworth & Co. (Publishers), Ltd., London; Butterworth & Co. (Canada) Ltd., Toronto, 1946.

Sir Alexander Fleming, in the preface to this volume on penicillin of which he is the editor, has best reviewed the book by stating: "This series of articles gives a fair presentation of penicillin therapy as it exists today". Twenty-seven authors have collaborated to provide a succinct, readable account of all aspects of penicillin. Fleming has written an interesting chapter on the History and Development of Penicillin; also the section on the Bacteriological Control of Penicillin Therapy.

The first hundred pages are concerned with the manufacture, chemistry, pharmacology and methods of administration. The remainder of the book consists of 21 chapters regarding the use of the drug in the varied surgical and medical conditions in which it is indicated. The emphasis throughout is clinical rather than theoretical.

Although difficult to pick out separate chapters for special comment, it is evident that each is written by an authority in his field, and each treatise is characterized by a commendable brevity and clarity. This excellently arranged and authoritative volume will be well received by the profession.

Practical Malariology. Col. P. F. Russell, M.C., A.U.S., Parasitology Division, the Army Medical School, Field Staff, International Health Division, Rockefeller Foundation (on leave); L. S. West, Head of Biology Department, Northern Michigan College of Education; and R. D. Manwell, Professor of Zoology, Syracuse University, New York. 684 pp., illust. $9.00. W. B. Saunders Company, Philadelphia and London; McAinsh & Co., Limited, Toronto, 1946.

This is another in the excellent series of military medical manuals prepared under the auspices of the Division of Medical Sciences of the National Research Council of the United States during World War II. However, as the authors point out, it was completed after the end of the war and, therefore, written from the standpoint of civilian as well as military needs.

The subject matter is divided into six sections, the first part dealing with the parasite and including a description of the morphological and physiological characteristics of the plasmodia and a brief, but useful, description of plasmodia found in animals other than man. This section closes with a discussion of field and laboratory techniques for demonstrating the malarial parasite. The second section discusses the mosquito host of the malarial parasite and deals first with the morphology and taxonomic characteristics of all stages of the life cycle; it then proceeds to discuss mosquito bionomics, and a useful inclusion in this part is the extensive number of photographs showing mosquito breeding sites. Third, the mosquito distribution throughout the world is discussed, and finally there is a most extensive discussion of field techniques for mosquito studies. The third section deals with malaria as it affects its intermediate host, that is, man. It includes a discussion of the pathology, symptomatology and treatment of malarial infections. Blackwater fever is also dealt with in this section. Section four is entitled "The community" and deals with the epidemiology of malaria from the standpoint of man, the mosquito and the environment. It includes a useful discussion on the technique of carrying out malaria surveys. Section five discusses drug prophylaxis and the control of the vector mosquito and its larval stages. Section six deals chiefly with the question of therapeutic malaria. The appendix contains a useful key to the adult mosquitoes of the world.

This manual presents a useful summary of the more recent advances in the field of malariology and is of particular value in that it depicts the lacunæ still existing in our knowledge of the various phases of malariology. The reviewer feels that the section dealing with the clinical aspects of malarial infections is not as comprehensively dealt with as the other sections included in this text. However, for any one starting out on a malaria control campaign this manual should prove invaluable. It should probably be mentioned that since the book was published, paludrine, which is only mentioned casually in the text, has been shown by J. H. Fairley to hold promise as one of the most useful drugs available both for the prophylaxis and treatment of all species of malaria. This book may unhesitatingly be recommended.

Textbook of Clinical Neurology. J. M. Nielsen, Associate Medical Professor of Medicine (Neurology), University of Southern California. 699 pp., illust., 2nd revised ed. $7.50. Paul B. Hoeber, New York, 1946.

The presentation of the material is rather unique. The neurologist will find the book of interest if he wishes to look up the author's experience with lesions causing aphasia or related syndromes. For the general

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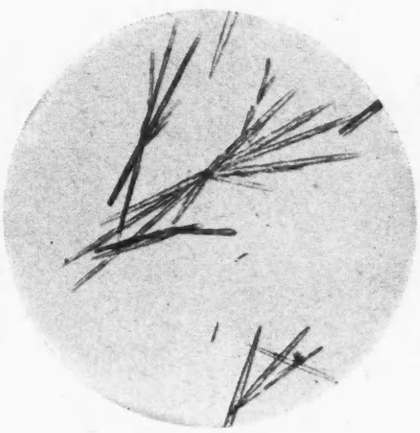

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practitioner this part of the presentation is too technical and deals with rare clinical entities. The material dealing with the various diseases of the nervous system is not well organized and sometimes one has the impression that the author set his thoughts down as they came to mind. Many of these thoughts as recorded are very good, but in most instances need amplification. For example, he states that he has seen convulsions ended by appendectomy in three cases. Personal experiences such as this are frequently recorded in great detail throughout the book. Such statements have no place in neurological texts unless they are thoroughly discussed. There is a great tendency throughout the book to describe the many syndromes which honour neurologists by name, but which many of us strive to forget in the hope of attaining an outlook on neurology based on neuroanatomy and neurophysiology. For example, many so-called syndromes of the brain stem are described, but there is nothing much to guide the practitioner in regard to treatment or prognosis even if he might succeed in calling one of them by name in a given patient. The discussion on neurosyphilis leaves much to be desired and the discussion of treatment might well be considered quite out of date even before the days of penicillin. No emphasis is placed on the importance of giving fever therapy early in neurosyphilis. Malaria is mentioned very casually as a method of treatment. The chapter on head injuries is rather incomplete. In some instances the author seems to have lost perspective and for example gives two pages to the discussion of Thomsen's disease while a paragraph is given to a relatively more common disease myotonia atrophica. Some chapters were quite well presented and the reviewer found the text rather interesting to read but not as helpful a reference as he had hoped. Neurologists will find it worthwhile to have a copy at hand and some general practitioners may find it interesting.

The Human Ear. S. L. Polyak, Professor of Anatomy, the University of Chicago; G. McHugh, Medical Illustrator, the University of Chicago Clinics; and D. K. Judd, Assistant Professor Otolaryngology, the University of Chicago. 136 pp., illust. $10.50. Published under the Auspices of Sonotone Corporation, New York, 1946. Distributed by T. H. McKenna, Inc., New York.

One would expect a monograph on the anatomy of the ear to be a detailed compendium for the specialist. This book, while valuable to the otologist, is refreshingly simple and straight-forward, so that it is also useful to the practitioner and student. It consists of a series of excellent illustrations with a text designed principally as a commentary on the drawings. The transparent paintings which superimpose one on another to build up the region are exceedingly detailed, but this is necessary in such a complex organ, and they are extremely factual. By contrast, the text seems almost oversimple, and is of considerable help in providing understanding of the drawings. On the whole this is an excellent treatise on the ear as well as a valuable new method of presentation.

BOOKS RECEIVED

Studies in Hypertrophy. I. Harris, Honorary Director, Institute for Prevention of Disease; Honorary Physician, Liverpool Heart Hospital, in co-operation with J. T. Ireland, Leverhulme Research Fellow; G. V. James, Maurice Stern Research Fellow; E. C. Lowe, Director, Pathological Department, Southport Infirmary, an C. E. Vernon, Research Fellow. 114 pp. $3.75. John Wright & Sons Ltd., Bristol; Macmillan Co. of Canada Ltd., Toronto, 1946.

Tumores Broncogenicos. H. D. Aguilar, Encargado del Departamento de Cirugia Toracica, Servicio del Dr. R. Finochietto, Hospital Rawson. 450 pp., illust. Libreria Y Editorial "El Ateneo" Buenos Aires, 1946.

Aids to Medical Diagnosis. G. E. F. Sutton, Hon. Physician, Bristol Royal Hospital. 308 pp., illust., 6th ed. $1.25. Baillière, Tindall & Cox, London; Macmillan Company of Canada, Toronto, 1946.

Aids to Tropical Hygiene. Edited by L. Nicholls, Late Lecturer in Tropical Diseases, Ceylon Medical College. 217 pp., illust., 3rd ed. $1.25. Baillière, Tindall & Cox, London; Macmillan Company of Canada, Toronto, 1946.

British Encyclopædia of Medical Practice Including Medicine, Surgery, Obstetrics, Gynæcology and Other Special Subjects. Medical Progress, 1946. Editor in Chief, Rt. Hon. Lord Horder, Physician to the King. 498 pp. $10.00. (Supplement Included). Butterworth & Co. (Publishers), Ltd., London, 1946.

British Encyclopædia of Medical Practice Including Medicine, Surgery, Obstetrics, Gynæcology and Other Special Subjects. Cumulative Supplement, 1946. Editor in Chief, Rt. Hon. Lord Horder, Physician to the King. 267 pp. Butterworth & Co. (Publishers), Ltd., London, 1946.

Centennial of Surgical Anæsthesia. An Annotated Catalogue of Books and Pamphlets Bearing on the Early History of Surgical Anæsthesia. Compiled by J. F. Fulton, M.D. and M. E. Stanton, A.B. 102 pp. Henry Schuman, New York, 1946.

Chemotherapy. Sir Alexander Fleming, Professor of Bacteriology, University of London. 39 pp., illust. 2s. University Press, Cambridge; Macmillan Company of Canada, Toronto, 1946.

Clinics. Vol. v, No. 2. Edited by G. M. Piersol, Professor of Medicine, Graduate School of Medicine, and Professor of Clinical Medicine, School of Medicine, University of Pennsylvania, Philadelphia, Pa. 284 pp., illust. $2.00. J. B. Lippincott Company, Publishers, Philadelphia, Pa., 1946.

Edinburgh Postgraduate Lectures in Medicine. Vol. 3, 1942-43. 586 pp., illust. 15/-. Published for the Honyman Gillespie Trust by Oliver and Boyd, Edinburgh, 1946.

Gynæcological Endocrinology for the Practitioner. P. M. F. Bishop, Lecturer in Applied Physiology, Guy's Hospital Medical School. 124 pp. $1.75. E. & S. Livingstone, Edinburgh; Macmillan Company of Canada, Toronto, 1946.

Gynakologische Diagnostik. W. Neuweiler, a.o. Professor fur Geburtshilfe und Gynakologie an der Universitat Bern. 474 pp., illust. Fr. 58. Medizinischer Verlag Hans Huber, Bern; Grune & Stratton Inc., New York, 1946.

Health Insurance in the United States. N. Sinai, O. W. Anderson, M. L. Dollar, School of Public Health, University of Michigan. 115 pp. $1.50. The Commonwealth Fund, New York, 1946.

Les Stomatites. Conférences des Stomatologistes des Hôpitaux de Paris. MM. Lebourg, Hénault, Lambert, Cernéa, Friez, Hennion et Vrasse, Mme Chaput. 214 pp. 220 fr. Masson et Cie, Editeurs, Paris, 1946.

Lip Reading. M. Faircloth. 64 pp., revised ed. 75c. The Ryerson Press, Toronto, 1946.

Manual of Tomography. M. Weinbren, Adviser in Radiology, Union Defence Force; Assistant Radiologist, the Middlesex Hospital (London). 270 pp., illust. 45s. H. K. Lewis & Co. Ltd., London, 1946.